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## ADDRESS

### THE INFLUENCE OF OSLER ON THE PRACTICE OF MEDICINE\*

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I DEEM it a rare privilege as well as an honor to be asked to talk to you, members of the medical profession of Nova Scotia, on some aspects of the life and work of Sir William Osler. No one could have a more inspiring theme in the field of medical biography. Not only Upper Canada, but the entire Dominion may well claim Osler as the most perfect product of her soil.

Above the fireplace in the library of his Baltimore home and later in Oxford were panelled portraits of three great physicians, Linaere, Sydenham, and Harvey. The scroll upon them bore the words, *Litterae, Praxis, Scientia*. In each of the three branches of knowledge in which these three men individually excelled he gained distinction.

Linaere was one of a small band of sixteenth century scholars who restored the light and learning of Greece to the profession, and with him the ideals of Plato and of Aristotle lived again. Osler, three centuries later, was also filled with the spirit of Greek learning, and Plato and Aristotle were his masters. Osler was the first physician to be elected president of the British Classical Association, and his address before that body showed his love and his knowledge of the old humanities. Linaere was one of the founders of the College of Physicians of London, and in his turn Osler was a founder of medical societies,—both the Association of American Physicians and the Association of Physicians of Great Britain and Ireland owe their origin in part to his efforts.

As a practising physician he takes high rank in the list of those counted worthy successors to the great Thomas Sydenham, the prince of English physicians. Since Richard Bright there has been no British or American physician more distinguished in the practice of medicine and no one who has done more for its advancement than William Osler. He has been compared to Boerhaave as a teacher and clinical investigator. As he was fond of referring to Sydenham as the English Hippocrates, and to Heberden as

the English Celsus, we today may with equal justice call Osler the English Boerhaave. It is said that Boerhaave at the mention of the name of Sydenham always removed his hat, and Osler, by the tone of his voice and by his manner, conveyed to students his veneration for Sydenham.

He was not a genius like William Harvey, but his devotion to science and to truth was no less pure. Although he made no great contribution to science he devoted the first fifteen years of his professional career largely to physiology and morbid anatomy and he used throughout his life the method of science at the bed side. Possibly his most important single contribution to medicine was his early study of the blood platelets carried on under Burdon Sanderson, the distinguished English physiologist. As a young man he sat at the feet of Rudolph Virchow, the greatest medical scientist of his time. Virchow was a commanding influence in his early medical life, and for years his demonstrations in pathology at McGill were modeled after those of this great teacher. In later life Osler paid a tribute to Virchow, the man and the student, in words that might with equal truth be applied to Osler himself. "Surely the contemplation of a life so noble in its aims, so notable in its achievements, so varied in its pursuits, may well fill us with admiration for the man and with pride that he is a member of our profession. The influence of his work has been deep and far reaching, and in one way or another has been felt by each one of us."

As above his fireplace were the names of these three great physicians, so his textbook is dedicated to the memory of three men—the Rev. W. A. Johnson, priest of the Parish of Weston, Ontario; James Bovell of the Toronto School of Medicine, and R. Palmer Howard, professor of medicine at McGill. Partly from Johnson and in part from James Bovell he received his early training in natural science. Both taught him by example the importance of making and recording careful observations, and from them he gained proficiency in the use of the microscope. It was Father Johnson, his early teacher at

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Trinity College School, that aroused in young William Osler a love of the best in literature, and it was Johnson who introduced him to the *Religio Medici* of Sir Thomas Browne which became his life long companion and mentor. A remarkable school master to have been able to instill into the mind of a lad such love of good reading that the second book he should buy with his own money was "*Religio Medici*," at the time an almost forgotten English classic. The volume, the Ticknor and Fields edition of 1862, went with Osler's body to his funeral. In those youthful days of close association with Johnson his habit of quoting passages he loved was doubtless formed. His first paper, entitled "*Christmas and the Microscope*," begins with a quotation. Among private papers found after Sir William Osler's death was this statement in his own handwriting—"I was always fond of beginning with a quotation . . . and it is amusing to note even at the very start of my ink-pot career, a fondness for tags of quotations, this one from Horace, in those days a familiar friend."

From Palmer Howard, a man to whom the study and teaching of medicine was an absorbing passion, he received his chief instruction as an undergraduate in the practice of medicine. From him he learned to correlate symptoms and physical signs with morbid anatomy. Osler regarded him as an ideal teacher because a student. From him Osler got his introduction to Laennec, to Graves and to Stokes and became familiar with their works.

The influence of Osler was exerted in many ways on the practice of medicine, but more even by his character and life than by his teaching or writing. When a young man he chose "a path to a clear purposed goal." He had studied a year in preparation for the church when he heeded the inner call to become a physician instead of a priest. This shift in plans meant with him no lowering of ideals, no change in the fixed purpose of his life. Osler doubtless thought and rightly so that he could be of as much service to humanity or more in the profession he finally chose. He always obeyed the great commandment of Christ to love thy neighbor as thyself. He acted on his belief, "that we are here not to get all we can out of life for ourselves, but to try to make the lives of others happier." In the loving kindness that shone forth in innumerable acts, there was seen humanity at its best,—the divine spirit dwelling in the heart of man. His early teachers, Johnson and Bovell, were good Anglican Catholics. Bovell had more influence on Osler than any other man. Speaking of Bovell, he says, "caught in a storm which shook the scientific world with the publication of the *Origin of Species*, instead of sailing before the wind, even were it with bare poles, he

put about and sought a harbor of refuge in writing a work on *Natural Theology*." Doubtless perplexity of soul was Osler's lot and portion at this time, and his own spirit's bark may have been driven far from shore, but he always retained those elements in the early religion of his youth which were vital and spiritual.

Unlike most men Osler did not seek personal advancement or personal gain. He had not been engaged in practice a year in Montreal when he devoted all the money he received for taking charge of the smallpox ward of the hospital, \$500.00, for the purchase of a dozen microscopes for his students. He had very little money and no patients and the voice of prudence might well have urged him to put this money by for future emergencies. But those who knew Osler realize that nothing he could have bought for himself, not even books, would have given him the pleasure that this purchase for his students brought him. McGill became by his gift one of the few schools on this continent—possibly the first school, to furnish microscopes for the students' own use. A few years later a wealthy patient with a painful malady sought his help. Did the young physician think of the prestige a cure would bring him? No indeed. "To cure him," said Osler, "meant a million for McGill!" Cushing gives the story in his wonderful biography and it is well worth reading in detail.

Where Osler lived there Unity, Peace and Concord also dwelt. They followed him from Montreal to Philadelphia, to Baltimore, and then to Oxford. In the long period at Johns Hopkins, the influence he exerted extended throughout the profession of the state, as well as the city, and harmony reigned. He would never listen to gossip and he was not known to speak ill of anyone. There were of course men that he did not like, but he did not talk about them and probably did not waste time thinking of their shortcomings. The only time he ever rebuked me was when I attempted to criticize a man with whom he suggested I might do some work. He did it with only a word or two, but it was effective.

He did not feel the pinpricks. Little things are only great to little men. Dr. Osler was too big to notice them. I have seen him subjected to annoyances on several occasions that seemed to me very irritating, but there was no loss of his geniality and imperturbability. As Cushing truly says "he would not have recognized jealousy had he met her, green eyes and all." In this ability to remain serene amidst the trials of life and to banish disagreeable thoughts from his mind he was following his philosophy of life, which he summed up in the watch-word equanimity. Combined with this rare classic virtue there was a charming gaiety to his personality, a Celtic quality, quite foreign to our Anglo-Saxon temperament.

Osler made as accurate observations at the bedside as he had done earlier in his autopsy work and dictated notes in the wards and in his own consulting room while examining private patients. He once told me that it was his plan to devote fifteen minutes to taking the history of a case. On returning from an outside consultation he would dictate or write a terse but careful note on the essential features of the case he had just seen.

The secret of his success as a clinician is easily learned. It depended on the master word which, if any young fellow learns in his youth and applies daily to his tasks, will make, as he tells us, "the stupid man bright, the bright man brilliant, and the brilliant student steady." The magic word is, of course, work, as he divulged in that inspiring address that is or should be familiar to you all. Now, careful observation is work and the writing of records is more work. Few young medical graduates in the early years of practice lack time to make and record careful observations on the cases they see. Osler impressed upon his students the importance of careful note taking if they were to gain real profit by their clinical experience. It is interesting to read the notes Osler made on the cases that formed the basis of his first clinical studies—the initial rashes of smallpox. He was 25 years old at the time and had charge of the smallpox cases at the Montreal General Hospital. This was his first clinical appointment. Here is his first note on the first case of the series in the first paper:

CASE I. D. P. Aet. 14. Admitted November 28th. Vaccinated, one good mark. Revaccinated 8 days before admission; three points, which had taken, were just passing into the pustular stage. A diffuse erythematous rash of a dark red hue existed over the abdominal region, extending upwards in the lateral thoracic areas, and downwards upon the thighs. Face much suffused, extremities unaffected. On pressing the finger upon the skin of the abdomen, numerous petechiae were evident, most abundant in the groins, and inner surface of the thighs. Temperature 101°. Slight delirium. A papular eruption over face and arms. 29th—Erythema has disappeared, leaving the ecchymoses visible as small, dark, punctiform spots, closely set together in the groin and more scattered towards the navel. The largest existed in the lateral thoracic regions above the serrati muscles. A few were noticed on the legs about the inner surface of the tibiae. Course of the disease: Eruption became confluent on the face, discrete on the extremities and trunk. Not more than eight pocks appeared on the sites of the erythema. Instead of proceeding to maturation, the majority of the pustules aborted, and on the 11th day of the disease desiccation had begun."

These notes bear the mark of unusually careful observation. They with many others furnish the basis of the first paper in English on the initial rashes of smallpox, and a good paper it was. Knowledge of this early, non-specific eruption, enabled him to make a probable diag-

nosis of smallpox before the pocks appeared in some cases, as in that of the young Englishman narrated in Cushing's biography.

A great many of Osler's clinical notes are published in his monographs, and they have doubtless served as models to many aspiring practitioners. The other day an able physician, a native of Nova Scotia and a Master of Arts of Acadia College wrote me as follows:—"I have had much help in studying his histories of patients. His examples teach the student and the practitioner how to make observations and the way to make pen pictures of them. The study of his book on Abdominal Tumors years ago was the greatest incentive to careful observation and history-taking that ever came to me."

Careful observation requires more time for the examination of cases than is allowed in most hospitals particularly in the out-patient department. Osler always arranged his work so that he would not be hurried. When working in the out-patient clinic of the Orthopedic Hospital and Infirmary for Nervous Diseases in Philadelphia, his plan of taking only a few cases, I have been told by one of his associates there, caused much comment. The chiefs of the other services would see 10 or more cases in the two hours or so they spent in the clinic. Osler on the other hand would select a case and devote usually 30 minutes or an hour to it, then 30 minutes or more to a second case. In the remainder of the two hours he might see one or two more patients, but rarely more than three or four in all. I have heard him say that there was no reason why cases should not be as carefully worked up in a dispensary as in hospital wards. It was the simple matter of getting enough doctors on the staff to examine the patients properly. In the medical dispensary of the Johns Hopkins Hospital he had a large enough group to do the work leisurely and thoroughly. During the summer after my first year of clinical study I worked there for a month. On the first day Dr. Frank R. Smith, who under Dr. Osler was in charge of the department, advised me not to take more than one or two new cases and to record as full and careful notes as I could make. One of the things Osler criticized vigorously was the practice of the routinist to see cases hurriedly and to make snap diagnoses. Leidy tells an incident that illustrates Osler's abhorrence of slovenly methods of diagnosis. One day a brilliant colleague at the University of Pennsylvania who was giving a ward talk to students gathered around a patient's bed, saw Osler walking through the ward and hailed him, "Hello, Osler, what is your diagnosis in this case?" Osler stopped and looked seriously at the patient as if in deep thought and then with a twinkle in his eye said, "Ah, Wood, wonder-

ful, wonderful, are the affections of the human frame. Good-bye, Wood," and he was gone.

Osler's text-book in the past 34 years has had a great influence in improving the practice of medicine through the English speaking world. No other work on internal medicine has had such a large sale. In 1905 the 100,000 copy was printed. The work is now in its tenth edition, and has been translated into French, German, Chinese and Spanish. The text-book immediately supplanted Flint's work which had run through many editions and had been a universal favorite in the United States. Nearly every page of Osler's book reflected the experience and personality of the man who wrote it. The work had an individuality that no other text-book of medicine possessed.

He was regarded a generation ago by some even among the leaders in the profession as a therapeutic nihilist and the only criticism made of his *Practice* was its weakness on treatment. He clearly recognized and frankly stated that for most diseases no curative treatment is available. He disliked useless drugging and he knew that credit given to a remedy often belongs to the healing power of nature. When his old pupil and friend, Darey, wrote from the Middle West that a frequent criticism there was the lamentable weakness of the book on treatment, and treatment was what the doctors wanted, he replied—"About my text-book, there is so much treatment abroad in the country that I have to do all I can to lessen it." Time has vindicated him, and the polypharmacy of his critics of those early days is as dead as alchemy. To demonstrate to his students what could be accomplished even in a case of chlorosis by fresh air, rest and good food, he once withheld iron for a time. I remember that to satisfy the desire of the patient to have some medicine he did give her the compound tincture of cardamom, which he told us possessed the three essentials—taste, color, harmlessness. The influence of his text-book in putting therapeutics on a sounder basis has been inestimable. Among the non-medical men it impressed was the Rev. F. T. Gates, the friend and adviser of Mr. John D. Rockefeller, to whom he conveyed his startling discovery that a cure is lacking for many of the most serious diseases of mankind. As the direct result of knowledge gained from Osler's text-book a great institute and a great foundation were established and millions of dollars have been wisely expended on medical research and medical education. All these benefactions of Mr. Rockefeller resulted from the fact that Osler's book was weak on treatment.

The clinical studies made by Osler were nearly all casuistical. He belonged to the group of great 19th century English clinicians, headed by Bright and Addison, that were chief-

ly concerned in the structural changes wrought by disease and their clinical manifestation. Osler, was, however, deeply interested in laboratory investigations and in pathological physiology in its relation to the clinic. Before going abroad to study medicine in 1902 I went to Baltimore to confer with him about work in Europe. He agreed with my proposal that it would be a wise plan to work with Krehl a leader among the younger physiological clinicians in Germany who looked upon disease at the bedside chiefly as a disturbance of function.

Osler's clinical interests covered the whole field of internal medicine. He was an acknowledged authority on certain forms of skin disease, especially the erythemas and purpura and his papers added much that was new, and are as valuable today as when first written. He studied children's diseases and was possibly the first to suggest a plan for determining the frequency of tuberculosis in children and the best means of its prevention. He was an excellent neurologist and wrote monographs on the cerebral palsies of children and chorea, based on cases he had himself studied. In fact his mastery extended over the whole domain. A list of his special interests would cover a number of specialties. No one had greater knowledge of typhoid fever and malaria. He was a pioneer in the modern study of diseases of the blood and an authority on heart disease, especially aneurism and acute and subacute endocarditis. To workers in tuberculosis he seemed especially interested in that disease, and few gastro-enterologists studied the diagnosis of abdominal tumors and of cancer of the stomach as thoroughly as this master of medicine. He enriched every subject he touched. F. Müller credits him with giving the first definite clinical descriptions of polycythemia vera and ochronosis, but with characteristic modesty Osler never claimed for himself the discovery of these diseases. Polycythemia he called Vaquez's disease and in his text-book does not mention his own important paper on ochronosis, but does refer to Virchow who reported the first case and described the pathology of the disease.

He established at Baltimore the first clinic in the world in which were combined the one-man system of German clinics and the English plan of clinical clerks and teaching visits in the wards. A salaried resident staff with appointments extending over a number of years was another important innovation in Anglo-American medicine that was of Teutonic origin. He was for fifteen years a "full-time" man in medicine and demonstrated its possibility of success long before it was discussed by modern educators.

I was fortunate to be a member of the second class of undergraduates which he taught at Johns Hopkins. He was an ideal teacher and



among his pupils a fellow student. He taught how observations should be made and recorded, and stimulated interest in every topic he discussed. One left his clinic eager to learn more about the disease of which he had just been shown an example. The importance too of studying the literature of medicine, especially the journals and the medical classics, was impressed upon us again and again,—not only must we be familiar with descriptions of diseased conditions written by master hands, but we must know something of the men who had built up the present day knowledge of medicine. One day in the course, after speaking of Blaud's pills, he turned to me and asked, "Who was Blaud?" When I replied that I did not know he told me to look him up and report what I could find at a later exercise. He frequently sent students on similar quests. The students often made a time consuming search of the literature when sent out on these excursions. I remember that my attempt to learn something about Blaud included a visit to Dr. Welch, whose aid was willingly given, and a trip to the Surgeon General's Library at Washington. After this labor we were allowed only five minutes for the presentation of our findings. The Chief was keenly interested when anything new to him was brought to light.

In addition to a weekly amphitheatre clinic and teaching rounds every other day in the wards, he gave the third year class two clinics a week in a class-room adjoining the medical dispensary. These were called observation clinics. In these exercises the master was seen at his best. His method of conducting this clinic marked a distinct advance in medical teaching.

He loved to teach in the wards and to combine instruction with the study of cases that had for him special interest. He did not limit this teaching to his own students or to the academic year. In the summer of 1910 he spent a few days at Scituate, Mass. One hot morning he left the cool seashore and journeyed to Boston. In the middle of the forenoon while making ward rounds with the internes at the Massachusetts General Hospital I was surprised on looking up from the patient I was examining to see Dr. Osler enter the ward. I had not known he was in this country. Before I had recovered from my astonishment he had walked across the ward and stood beside us. Instead of the customary salutation, his first words were, "What have you here?" He at once assumed charge of the visit and none of the four young men who were privileged to attend Dr. Osler's first and only ward clinic at the Massachusetts General Hospital will ever forget it. They often speak of it to this day. It was as delightful as the clinics he gave at Johns Hopkins or at the Radcliffe Infirmary in Oxford. He spent about

an hour and a half on the visit which included a trip to the library to look up the details of a famous case of dynamic dilatation of the aorta that Dr. Hobart A. Hare had published in the *Medical Record* over 20 years earlier and to consult another article to which he had alluded on the visit. Purpura and its various manifestations were discussed with a case as a text. One incident of this visit stands out with distinctness, because of an error he discovered in our diagnosis much to my chagrin. A case was shown as one of pulmonary infarct following an operation for appendicitis. After percussing the lower back on the affected side with the tips of four fingers (immediate percussion) as was his wont, he remarked that there was a good deal of resistance to the percussion stroke. He made no further comment, but when I asked him if he thought there was fluid in the chest, he replied, "I think so." He was right. The pleural cavity was tapped the following morning and about a liter of fluid removed, the existence of which we had not suspected!

Dr. Osler taught the virtue of taciturnity and illustrated its value by an experience of his own. In the early days in Montreal he was once called in consultation by an old physician for whom he had done autopsies. After the examination Osler was asked to speak to the family. This he did detailing at length the symptomatology, diagnosis and prognosis of the case. As they were leaving the house the old doctor turned to him and said, "Young man, you talk too much. For forty years I have practised medicine with a nod of the head."

It was delightful to listen to his brief talks with patients after he had examined them before the class. Advice was often given in pungent epigrams that must have stuck in the minds of all but the most heedless. To one careless liver indifferent of his fate he said:—"Remember, Dame Nature gives long credit, but she always sends in her bill."

Much has been written of the stimulus he gave his pupils and disciples. To see his boys work after they had graduated gave him great pleasure. At Hopkins I did not distinguish myself in anyway and graduated fourteenth or fifteenth in a class of 25. Dr. Osler first showed special interest in me a few years later. This was due I think to his conviction that I had considerable capacity for hard work. The way he had of stimulating a young man just starting in practice can be gathered from a few extracts from his letters to me written at that period of my career. For nearly four years after leaving Hopkins I had worked in pathology at Harvard and at the Boston City Hospital under Councilman and Mallory. Then after studying a semester with Krehl in the Tübingen Clinic I boldly began practice as a consulting physician in

October, 1902. I did so in order to be able to continue for a long period research work in the laboratory while at the same time at the Massachusetts General Hospital I could be gaining clinical knowledge and experience. Although less than twenty-five years ago there were then no salaried positions in clinical medicine in America open to a young graduate except on the resident staff of the Hopkins Hospital. I would probably not have made the venture if I had not had the support of Dr. Councilman who then and always was like a father to me. I think Dr. Osler must have been interested in my move. It was directly in line with the suggestions in his inspiring essay, "Internal Medicine as a Vocation," which he published when I was a medical student. Whether he regarded it as courage or cheek on my part I do not know, but there is no doubt that he gave me every help and encouragement. I never discussed my purpose with him nor did he ever refer to it.

I had been in practice less than three months when he wrote, "Do you not think you could come down this winter and give us a little talk at the Medical Society on something? We should be very glad indeed to have you. Anything in your line of work would do. . . . I am sure the battle will be with you in the end." His thought then turns to books. "I never saw James Jackson's Text Book of a Course of Lectures. I wish if you come across the first edition of the Letters to a Young Physician you would pick it up for me. Dr. J. J. Putnam, his grandson, is writing his life. His Memoir of James Jackson, Jr., is a capital thing. Have you ever read Friend's History of Physic?" Two weeks later came a letter that would have cheered the heart of any youngster eager for work. "Would it not be nice to have a sort of symposium on the blood platelets? I could take the historical and some minor clinical aspects, a man working in Howell's laboratory could take the physiological or histological and you could take the pathological. I think it would be most valuable.

One other point—at a recent meeting of the post-graduate committee of the Faculty I was commissioned to ask you to give one of the evening lectures to the post-graduates on any subject you see fit. There is one week given throughout May and June. Sorry we cannot offer a very large honorarium, but there would be a fee of twenty-five dollars, enough to pay your travelling expenses. If you come early in May while I am here, I shall expect you to stop with me. Please send me an answer to this at once. Would it be interesting if you took up some aspects of modern cardiac pathology? You might kill two birds with one stone perhaps if you came down early in May, say the first Monday for the symposium on blood-platelets, you

could then give your lecture on Tuesday evening. How would this suit you?" I gave the lecture that spring, and following Dr. Osler's suggestion selected the Causes of Cardiac Insufficiency as my subject. Probably the \$25.00 for my expenses came from his own pocket, but I never suspected it at the time.

He never forgot his plan of having a symposium on the blood-platelets. Although obstacles developed, it was finally held two years later, only a few months, in fact, before his departure for Europe. During the interval he wrote urging me to continue my work on the platelets. It should be remembered that Osler was one of the first to study these little bodies, and his interest in them never waned. When at this meeting Dr. Kemp, the physiologist, described haemoglobin in platelets in the blood of persons on Pike's Peak, Dr. Osler, in the discussion, said he had watched a good many platelets but "had never seen one blush." This shows how he could make a criticism and at the same time extract its sting.

His generosity knew no limit. He gave away money and books, and even his own unpublished work, as the following incident shows. One of his favorite diseases was purpura. After asking me to write the section on this subject for his system of medicine, he turned over to me a large fasciculus filled with detailed notes of cases he had seen, an unpublished lecture, and many abstracts and journal clippings. This material had been carefully gathered with the evident purpose of writing a monograph on purpura. Probably my free and full utilization of this material explains why his intent was never carried out.

Thoughts of distant friends were always coming to his mind. One day in Vienna three years after he had left America we were strolling along the street and passing by chance a book stall, he stopped and said, "I will pick up something here to send Jacobi." He selected a small pamphlet and at once mailed it. The cost was so small, a mark or two, that anyone could have afforded it. He was always doing little acts of kindness like this, and always thinking of old friends. He recognized that the medical men in general practice forms the bulwark of the medical profession, and he gave them every encouragement within his power, when they published anything in the way of clinical investigation that seemed valuable to him. So that many a lone pioneer worker, far removed from medical centers, has been encouraged and stimulated by receiving a few lines of approval from this leader of our profession. Soon after he had settled in England he journeyed to Burnley to see that greatest of general practitioners of our generation, Dr. James Mackenzie, and to learn of his work at first hand. Dr. Mackenzie told

me that Osler was the first and only English physician of note to visit him there.

It was regarded both a privilege and a duty by Osler to support the medical societies with which he was connected by regular attendance at their meetings. Long trips for this purpose were often made. These were apparently no hardship so keenly interested was he in his medical brethren everywhere. The first time I ever saw him was at a meeting of the journal club of the house staff at the Johns Hopkins Hospital. Dr. Simon Flexner, then resident pathologist, gave a review of recent work on the coagulation of the blood and Dr. Osler opened the discussion. Few busy clinicians at that time I think would have shown such interest in a topic in physiology so unrelated to clinical medicine. He never lost his early attachment to pathology and in the spring of 1904 when pressure of work must have been heavy he took the time to go to New York and spend an hour or two with the pathologists at their annual meeting. He rarely attempted to hear all of the papers or to attend every session. It was his custom to give a luncheon at the meetings to a few friends and to include one or more of the younger men. At the Vienna Congress of Internal Medicine, which I attended in his company, his guests were all younger clinicians and each of a different nationality,—German, Dutch, Austrian and American.

Provincialism and chauvinism he regarded as the demons of ignorance. How often he urged a quinquennial braindusting to be taken anywhere except in one's own city and state. He himself broke down national barriers and recognized the good wherever he saw it either in men or in their work. He recognized the present leadership of German medicine. There Minerva Medica will have her abode, as he put it, until in some other land her worshippers be-

come more devoted. When England was at war with Germany he was so untouched by the passion of hate that he was able to write his friend, Friedrich Müller, of Munich in 1915, that the German wounded that he had personally looked after "are the nicest fellows."

If Osler came to Halifax to live among you it does not require a prophet's vision to know what he would do. He would bring the same spirit of brotherly love that he carried from Montreal to Philadelphia and which abode with him to the end. He would teach by example the importance of careful observation at the bedside and the accurate recording on the spot of details observed. He would stimulate research in the clinic and in the laboratory. He would show by his acts that he was seeking nothing for himself, but everything for you. He would be especially the friend of the young men and of the old. He would visit your medical library the second day he was in town, if not the first, and he would at once begin to enrich it. A book and journal club would be formed among the younger men and meetings regularly held. He would strive in every way to elevate medicine here, and his influence for good would prove a most potent ferment. Jealousies and misunderstandings would disappear like mist before the summer's sun.

There were no two sides to Sir William Osler. He was always sincere, always charitable, always striving to bring happiness to others and inspiring others to devote themselves more whole-heartedly to the advancement of the science and the practice of medicine. Many an old pupil feels in regard to him the truth of the verse he quoted when mourning the loss of his old master, Dr. Palmer Howard,—

"Whatever way my days decline,  
I felt and feel, tho' left alone,  
His being working in mine own,  
The footsteps of his life in mine."

## ORIGINAL ARTICLES

### A CLINICAL STUDY OF EPILEPTIC CHILDREN TREATED BY KETOGENIC DIET

BY FRITZ B. TALBOT, M.D., KENNETH M. METCALF, M.D., AND MARGARET E. MORIARTY, S.R.\*

In a previous paper<sup>1</sup> the results of chemical investigations of the rational treatment of epilepsy by ketogenic diet, which were carried out in this clinic, have been reported. It was shown that the ketone forming diets caused changes in the blood and urine chemistry similar to those

produced by fast. The changes are coincident with an improvement in the condition of the epileptic child.

This report deals first with a discussion of the ketogenic diet used in this clinic and its fulfillment of the needs of the child; and secondly, with the beneficial results to the epileptic child by the dietary treatment.

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## I.

*The Basis of Treatment by Ketogenic Diet:*

The production of a ketosis by a special diet was first used by Wilder<sup>2</sup> and Peterman<sup>3</sup>, and later by this clinic, as a method of treatment for patients with epilepsy. When a ketosis is produced and becomes pronounced the epileptiform attacks in children usually diminish in number or disappear. It is with this end in view that the diets have been planned for the child in order to produce a ketosis, and then gradually to intensify it.

The principle involved is that of ketogenesis elaborated by Shaffer<sup>4</sup>, Woodyatt<sup>5</sup> and others. Since complete combustion of fat to carbon dioxide and water is due to the presence of a sufficient amount of available carbohydrate, in the absence of the latter intermediate products of fat catabolism are left unaltered and these ketone bodies are excreted in the breath and urine. Shaffer worked on the hypothesis that the property possessed by carbohydrate and other substances of preventing the appearance of acetone bodies was due to a chemical reaction in the body between definite amounts of "ketogenic" and "antiketogenic" compounds. From the earlier assumptions Shaffer concluded that his data indicated that one molecule of glucose was ketolytic for one molecule of ketogenic substance, but later study seemed to show that in severe ketosis one molecule of glucose is ketolytic for two molecules of fatty acid. Shaffer proved that the production or excretion of acetone bodies is dependent on the relative

amount of protein, fat and carbohydrate in the mixture undergoing combustion at the time.

Therefore, all ketogenic diets must be so arranged that they contain an excess of ketone forming foods over those which prevent the formation of ketones; as a result there is a large production and excretion of ketone bodies. It has been found that a reduction or cessation of the epileptic attacks can not be expected until the diet is sufficient to produce a marked ketosis.

*Fulfillment of Needs of the Child by Ketogenic Diet:*

Several factors must come under consideration when a child is put on such a one-sided diet as is necessary to cause a ketosis. It is, of course, essential that the diet should be complete in total calories, protein, vitamins and salts.

The total caloric requirement, as has been often emphasized in the literature, will depend on the height, weight and physical characteristics of a child, as well as the mode of life. The more active the child, the more calories will it need. In this group of children normal activity is encouraged, but it has seemed best not to have them undergo severe muscular strain, and over-fatigue is guarded against. With this in view, the total calories in the diet given must be sufficient not only to maintain the body weight with normal activity, but also to allow a surplus for growth.

The total caloric needs should be based upon the normal weight of the child for its height. The basal needs<sup>6</sup> for expected weight will be found in Table I. Fifty per cent should be

TABLE I  
BASAL REQUIREMENTS OF BOYS AND GIRLS OF VARIOUS WEIGHTS  
Talbot—Physiological Review  
Basal Heat Production of Boys and Girls Per 24 Hours Predicted From Body-Weight.

Body-weight, (with-out clothing)	Predicted heat		Body-weight (with-out clothing)	Predicted heat		Body-weight (with-out clothing)	Predicted heat		Body-weight (with-out clothing)	Predicted heat	
	Boys	Girls		Boys	Girls		Boys	Girls		Boys	Girls
kilos	cal.	cal.	kilos	cal.	cal.	kilos	cal.	cal.	kilos	cal.	cal.
2.5	115	110	11.5	607	595	20.5	875	818	29.5	1103	1032
3.0	150	150	12.0	625	610	21.0	885	830	30.0	1115	1045
3.5	185	185	12.5	643	628	21.5	896	842	30.5	1127	1058
4.0	210	220	13.0	660	640	22.0	910	855	31.0	1140	1070
4.5	240	235	13.5	678	652	22.5	925	867	31.5	1150	1080
5.0	270	285	14.0	695	665	23.0	940	880	32.0	1160	1090
5.5	300	318	14.5	710	678	23.5	955	890	32.5	1170	....
6.0	330	350	15.0	725	690	24.0	965	900	33.0	1180	....
6.5	360	377	15.5	740	700	24.5	978	915	33.5	1190	....
7.0	390	405	16.0	755	715	25.0	990	930	34.0	1200	....
7.5	418	432	16.5	768	722	25.5	1005	940	34.5	1210	....
8.0	445	460	17.0	780	735	26.0	1020	950	35.0	1220	....
8.5	470	480	17.5	793	747	26.5	1035	962	35.5	1230	....
9.0	495	505	18.0	805	760	27.0	1045	978	36.0	1240	....
9.5	520	520	18.5	818	770	27.5	1058	987	36.5	1248	....
10.0	545	540	19.0	830	780	28.0	1070	1000	37.0	1255	....
10.5	568	560	19.5	845	793	28.5	1080	1010	37.5	1265	....
11.0	590	580	20.0	860	805	29.0	1090	1020	38.0	1275	....

<sup>6</sup>From Benedict and Talbot: Carnegie Inst. Wash., Publication #302, p. 206.



added to the basal needs to allow for exercise, growth and loss in excreta.

It will be seen that these figures are somewhat lower than those recommended by Holt. The reason for this is that the normal children whose caloric requirements for different ages and weights were studied by Holt, were boys and girls who were taking part in all types of athletics and consequently needed more food to supply the energy for their excessive exercise.

It has been found that the children who received their basal requirements plus 50%, with rare exceptions, gained weight in a normal manner. This made it clear that their total caloric requirements were being supplied, even though the total calories of the diet may not be completely utilized.<sup>8,9</sup>

The protein requirements of children have been less accurately known, various amounts having been thought necessary by different authorities. In general they are very high, varying from 1-1/2 to 2 grams per kilogram of bodyweight in infants, to between 2-6/10 and

Clinically, the physical development of these children progressed in a normal manner and in some instances the musculature and flesh seemed to harden up and become firmer than it was before this type of diet was instituted. In no instance was it observed that the children became weaker, nor was it evident that this small amount of protein deprived them of anything necessary for their muscular growth.

The vitamin requirements are sufficiently supplied in this diet. The diet is planned to include the vegetables which contain the water soluble vitamins. The fat soluble vitamins are supplied largely in the butter and eggs. It is found advantageous in these cases also to give cod liver oil, which is especially potent in the fat soluble vitamin.

The mineral requirements of the children also are fulfilled, and there is no restriction of salt intake.

#### General Health of Patient On Ketogenic Diet:

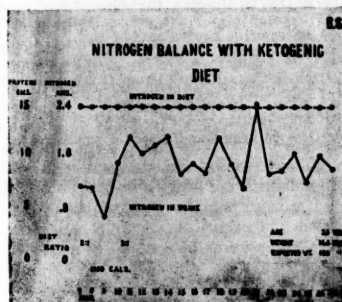
The foregoing discussion of the ketogenic diet has considered the fulfillment of the caloric needs, the protein needs, the vitamin and the salt needs of the growing individual. The following discussion deals with the general health of patients on a ketogenic diet. Its therapeutic effect on their epileptic symptoms will be considered in the second part of this paper.

When the ketogenic diet is increased to a ratio greater than two parts of ketogenic material to one part of antiketogenic material, a ketosis occurs. In a previous paper<sup>1</sup> it has been shown that this ketosis is of various degrees and is very pronounced on the higher diets. A marked ketosis is to be expected from any accurately followed diet in which the ratio is three to one. This is evidenced by the rapid appearance of the test for acetone in the breath by the Scott Wilson solution; by the large amounts of acetone excreted in the urine; and by the large amounts of acetone in the blood. In the past such findings would have been looked on as dangerous to the health of the patient but experience in this and other clinics has shown that a marked ketosis may be maintained over a long period of time without any untoward symptoms whatsoever. The possibility of its causing symptoms was continually borne in mind.

It was found, however, that the concern was unnecessary and that these patients could withstand mild infections even though a marked ketosis had been caused by diet; and that the ketosis during their infection did not necessitate a change in the diet. The general health of these children during the ketosis improved and it was noticed that they seemed to be more free from infection than were the other members of the family in which they lived.

CHART I

ILLUSTRATIVE CASE OF NITROGEN BALANCE ON KETOGENIC DIET



4 grams in older children<sup>10,11</sup>. On account of the character of the ketogenic diet it is desirable, and sometimes imperative, that the amount of protein be kept as low as possible. Urine analysis showed in the cases studied by us that the nitrogen balance of the body in practically all instances, was positive when 1 gram of protein was given per kilogram of the expected body weight of the child. For an example case see Chart I. Bartlett<sup>12</sup> found in diabetic children who were underweight that the nitrogen balance could be kept positive over a long period of time on one gram of protein, and in some children, even with 6/10 of a gram of protein per kilogram of bodyweight.

These findings seem to indicate that a non-diabetic ketosis may in some instances be of less clinical importance than was formerly supposed.

On any well controlled dietary regime there must necessarily be a regulation of the habits of life and for this reason the improved health of our patients on the diet must be partly attributed to such an adjustment. They are required to drink plenty of water, to have a rest hour when possible and to go to bed early. The bran in the diet helps to counteract constipation, and non-carbohydrate cathartics are given when needed. No other medication is given with the diet.

Some of the beneficial changes noted in the patients while following the diet have been increased general alertness, with diminished nervousness and excitability, and an improvement in their complexions. The children are encouraged to lead as nearly a normal life as possible, in fact two of the boys after having been freed from the attacks by the diet proudly asserted that they were the "best pinch hitters" on their respective base ball teams.

None of the patients studied in this clinic have had any gastro-intestinal or other symptoms due to the high fat content of the diet. In the case of one patient who had slight nausea, a more appetizing arrangement of the same ratio diet stopped the nausea and with a higher fat ratio there was no recurrence of symptoms.

#### The Calculation of the Diet:

In the treatment of epilepsy we are chiefly concerned with the production and the accentuation of the degree of ketosis for the clinical end desired. Since the constituents of the diet given to the patient are not necessarily utilized in the same proportions, a complicated and accurate method of computing the diet is not essential.

In this clinic a simple formula is employed in the calculation of ketogenic diets, by substituting the grams of food constituents directly in the formula rather than their ketogenic and antiketogenic components. The higher ketogenic diets are obtained by increasing the ratio of food fat to the combined protein and carbohydrate. The use of the ratio of fat to combined protein and carbohydrate in this manner allows comparison of the degree of ketosis obtained in children of various ages on diets containing the same proportionate amounts of fat. The ratio gives a standard for the expected extent of ketone production with which can be compared any improvement which may result in different children on the same ketogenic diet. It has been found satisfactory for

clinical purposes and, as shown in the footnote\*, may correspond very closely with Woodyatt's gram ratio of fatty acid to glucose, though neither ratio represents the diet actually metabolized.

The diet is calculated directly from the food constituents. The total caloric needs of the patient are obtained by adding 50 per cent to the basal metabolism for the normal weight of the child. (See Table 1.) An allowance of one gram of protein for each kilogram of body weight has been found sufficient to maintain nitrogen equilibrium and to allow a small quota for growth.

The following is an example of the calculation of a series of ketogenic diets given to one of our patients which resulted in freedom from epileptic convulsions.

Girl, age 12 years, weight 39 kg. Expected weight 40 kg.

Total basal requirements for Wt. + 50% = 1850 calories.

Protein requirement of 1 gm. per kilo expected body weight = 40 gms. (P).

(1)  $1.5:1 = F$  (gms. fat):  $C + P$  (gms. carbohydrate + protein)

(2)  $F = 1.5 (C + 40)$

The total caloric needs equal the combined calories from the protein, the fat and the carbohydrate. Therefore, 1850 will equal the sum of the calories obtained by multiplying the grams of food constituents by the caloric equivalents of each.

(3)  $1850 = 9F + 4C + 4P$

Substituting the value of F from (2) and the known value of P

(4)  $1850 = 9 [1.5 (C + 40)] + 4C + 160$

Then  $C = 66$  grams and  $F = 159$  grams.

\*A comparison of the food ratio used in this clinic (for example see page 10) with Woodyatt's and with Shaffer's<sup>1</sup>v ketogenic ratios.

The Woodyatt gram ratio is computed from the following formula:

$$\text{Ketogenic ratio} = \frac{\text{grams Fatty Acid}}{\text{grams Glucose}}$$

$$= \frac{0.46 \text{ gms. Protein} + .50 \text{ gms. Fat}}{1.0 \text{ gms. Carbohydrate} + 0.58 \text{ gms. Protein} + .10 \text{ gms. Fat}}$$

The molecular ratio according to Shaffer could be computed in the following manner:

Ketogenic ratio =  $\frac{\text{moles. ketogenic equivalents (as Aceto acetic acid)}}{\text{moles. antiketogenic equivalents (glucose)}}$

$$= \frac{15 \times \text{gms. urinary Nitrogen} + 3.43 \times \text{gms. Fat Burned}}{5.56 \times \text{gms. Carbohydrate Burned} + 20 \times \text{gms. urinary Nitrogen} + .57 \times \text{gms. Fat Burned}}$$

1850 Calories				Ratios		
				Food	Woodyatt	Shaffer
				gm.	moles.	moles.
				F:P+C	FA:G	K:AK
C = 66	P = 40	F = 159		1.5:1	1.53:1	1.02:1
C = 46	P = 40	F = 168		2:1	2.1:1	1.4:1
C = 20	P = 40	F = 180		3:1	2.96:1	1.97:1
C = 6	P = 40	F = 184		4:1	3.9:1	2.6:1

With the diet for this patient, as shown in the above table of comparisons, the two gram ratios correspond closely. The Shaffer molecular ratio is approximated by dividing the Woodyatt ratio by 1.5 (molecular weight of oleic and palmitic acid divided by molecular weight of glucose 270).

The increasing ketogenic diets on 2:1, 3:1, or 3.5:1 ratios are derived in like manner.

Any of the consecutive diets employed to cause a ketosis may be computed from the following general equation:

Total Caloric

Requirements =  $9 \times [R (C + P)] + 4C + 4P$   
R = Ratio (1.5; 2; 2.5; 3, etc.) of fat in diet to C. plus P.

C = Grams of carbohydrate in diet.

P = Grams of protein in diet (1 gm. per kg. body-weight).

As will be seen in the example diet, a greater proportion of fat is given than of combined grams of carbohydrate and protein. In the initial diet this is in a ratio of 1.5:1. After several days to a week the necessary diets with increasingly ketogenic ratios are instituted. A diet ratio between 3:1 and 4:1 has usually been found to have a beneficial therapeutic action, although considerable improvement is obtained from lower ratios with some patients.

## II.

### *Type of Cases Considered Suitable for Treatment with Diet:*

During the early study of the clinical effect of a ketogenic diet upon epileptic children it has seemed advisable to limit the type of cases treated, although the beneficial effect of the diet may have a greater scope than is indicated by the conservative selection of cases in this clinic. For instance, one private patient with convulsions and a history of birth injury has been benefited by the diet. Another child in the hospital with grand mal, who was considered definitely mentally retarded before starting a ketogenic diet, has been quite normal mentally since her convulsions were stopped by diet. Perhaps in this case the mental dullness had been due to exhaustion from her frequent and severe convulsions. A third child entered the hospital with a pronounced chorea as well as frequent petit mal attacks and within two weeks after starting the diet there was no evidence of chorea and she had been entirely freed from her epileptic attacks. During this period she was confined to bed and kept as quiet as possible, which undoubtedly benefited the chorea.

The type of cases treated in the Out-Patient Clinic of the Massachusetts General Hospital have been limited to that group of children having epileptiform convulsions of unknown etiology.

This group is determined by

- (1) Normal history (no birth injury).
- (2) Normal physical examination (any required treatment of teeth, tonsils, posture, etc., is given before institution of the diet).
- (3) No abnormal neurological findings by special neurological examination (lumbar puncture if indicated).

- (4) Normal mentality (determined by a special psychometric test).
- (5) Negative blood Wassermann.
- (6) Negative X-Ray of the skull.
- (7) Negative X-Ray of the gastro-intestinal tract.

Assured coöperation of the child and parents in an accurate following of the diet is essential. Considerable credit for the beneficial results of the diet obtained in this clinic must be given to the Social Service Department in securing the coöperation of the family.

The coöperative child with convulsions of undiscovered etiology is then started on a series of increasingly ketogenic diets.

### *Response of Patients to Ketogenic Diets:*

A ketogenic diet sufficient to produce a marked ketonuria in the patients resulted in a definite improvement of their epileptic symptoms. This was not attained in the majority of our ward or clinic cases until a 3:1 diet was definitely established. In some cases, although a ketonuria is produced, the degree of ketosis is apparently not sufficient to inhibit the epileptic seizures, so that higher fat ratios must be instituted.

The most efficacious ketogenic diets have been those with a large amount of fat and a minimal amount of carbohydrate. As has been shown, a change to the higher diet ratios is accomplished by a greater reduction in grams of carbohydrate than increase in grams of fat while the protein remains constant. This suggests that the benefit of this treatment might be due in part to a low carbohydrate diet rather than to a high fat diet, but a diet fulfilling the caloric requirements, planned on either basis, would have the same practical effect of producing a ketosis.

Children vary in their response to the establishment of a ketosis by a high fat diet. In some cases there may be a great reduction or even a cessation of attacks during the first week of the 2:1 diet. Previous to the institution of a ketogenic diet several of the children had been receiving an excessive amount of sweets to the exclusion of the other food constituents, so that the change was especially radical.

It has been observed in the Out-Patient clinic that where there have been dietary indiscretions in the form of antiketogenic foods, especially candy, there has resulted recurrences of attacks. A close adherence to the prescribed diet has usually corrected attacks.

A hospital residence of a couple of weeks is of advantage in establishing the diet, but where improvement was obtained it was found to continue after discharge when the diet was accurately followed. It is believed, therefore, that the temporary cessation of symptoms so often observed, where a patient enters a hospital and is put on any standardized diet and regime, did not modify the course of events in the patients

reported here. It is also quite possible that this previously unexplained improvement which has been commented on in many clinics, may have been the result of a relative restriction of the carbohydrate intake.

One patient having about fifty attacks a day in the hospital was given a diet restricted in carbohydrate and increased in fat content, sufficient to produce a marked ketosis. When her diet ratio was 3:1 her attacks were reduced to about six daily. Higher ratios resulted in a cessation of attacks. Within a short time after the patient was given a diet similar to what she would ordinarily have at home, high in carbohydrate and low in fat foods, her attacks recurred at their usual rate. This is graphically illustrated in the accompanying chart.

CHART II  
ATTACKS IN RELATION TO DIET RATIOS AND  
BLOOD CHEMISTRY

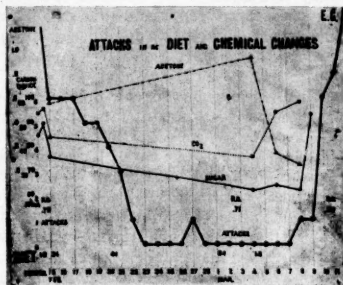


Chart II not only shows the relationship of the attacks to diets of different ratios but also the blood chemical changes brought about by the high ketogenic diet. The return to normal of the blood constituents after a home (1:6) diet was given resulted in a recurrence of attacks. The blood sugar level alone had a delayed return to normal, and there was no recurrence of attacks until twelve hours before the first normal blood sugar.

This suggested the possibility that one of these chemical changes alone might be associated with the improvement of the epileptic symptoms, or in other words, that the freedom from attacks was due mainly to a hypoglycemia rather than to an acidosis or a ketosis or a combination of the three. With this in view, insulin was administered to this patient on a moderately restricted carbohydrate diet in the hope that on an ordinary diet her attacks might be controlled by producing a hypoglycemia. After three months study of insulin therapy in the treatment of epilepsy it was found impractical.

The patient E. G. (Table II) later was again given a high ketogenic diet which she has followed at home with freedom from attacks for a period of three months to date.

A cessation of attacks in epileptic children has resulted both from fast and ketogenic diet. Accompanying the improvement in the epileptic symptoms there are similar chemical changes from fast and ketogenic diet as will be seen in Chart III and Chart IV.

CHART III  
ATTACKS AND BLOOD CHANGES WITH FAST

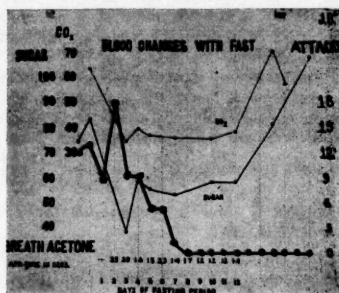
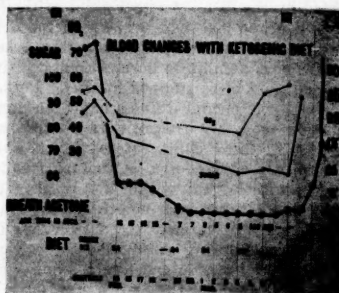


CHART IV  
ATTACKS AND BLOOD CHANGES WITH KETOGENIC DIET



The patient represented in Chart III returned to the hospital two years after her fast and was given a ketogenic diet. Blood was taken only twice during her hospital residence, while she was receiving a house diet and after seventeen days of a ketogenic (3:1) diet. There was a drop in her blood  $\text{CO}_2$  combining power from 53.3 to 45.2 volumes per cent; a drop in her blood sugar from 99 to 67 mg. per 100 c. c., and an increase in her blood acetone to .450 grams per liter. She had fifteen attacks daily before



starting the diet. On a 3:1 diet for nine weeks, no attacks have occurred.

#### Report of Cases:

The group of cases in this study includes patients treated in the clinic, on the ward, and in private practice. This report summarizes mainly those patients who have followed the prescribed diets, as shown by careful check-up of the diet given, as well as by consistent positive urine acetone tests. A number of other cases have been benefited although following the diet inaccurately but are excluded from the present summary.

The clinical results in this group of cases are

#### CONCLUSIONS

I. The ketogenic diet fulfills the needs of the child. Urine analysis indicates that one gram of protein per kilogram of expected body weight maintains nitrogen equilibrium.

II. A marked ketosis may be maintained over a long period of time without any unfavorable symptoms. On the contrary, the general health of the patients has been excellent, which may in part be attributed to the regulation of their habits.

III. A simplified method of calculation of ketogenic diets is employed, expressed by a ratio of the food constituents.

TABLE II  
Case Records on Ketogenic Diet

Case	Sex	Age	Present Diet			Ratio	Time on Present Diet	Frequency of Attacks Before Diet		Results Attacks and Comments
			C	P	F			Grand Mal	Petit Mal	
I J. S.	♂	7 yr	25	27	155	3:1	9 mos.	None	5-6 per mo.	No attacks for 9 mos.
II E. G.	♀	12 "	6	40	180	4:1	3 "	none	50 daily	No attacks for 11 weeks
III E. J.	♀	7½ "	20	26	135	3:1	10 wks.	6-15 nightly	none	No convulsions since 2:1 diet established (11 weeks)
IV D. W.	♂	13 "	19	53	180	2½:1	7 mos.	Every two mos.		Followed diet poorly. Two convulsions in 7 mos.
V R. B.	♂	7 "	23	27	150	3:1	3 mos.	None	6-8 daily	No attacks when follows diet
VI B. S.	♂	3½ "	20.5	18	106	3:1	7 mos.	Series every 3-4 months		No convulsions in 8 mos.
VII J. S.	♀	22 "	12	39	181	2½:1	5 mos.	Ev. 2 wks.	None	Frequency diminished, one period 13 wks. freedom. Occur once in 5 wks, lessened in severity.
VIII N. T.	♀	3 "	18	14	98	3:1	6 wks.	1-4 weekly	None	No attacks for 7 wks. Attacks stopped on 2:1 ratio
IX J. B.	♀	12 "	14.5	50	193.5	3:1	2 mos.	1½-18 daily	Grand and petit mal	No attacks 9 weeks. Stopped on 2:1 ratio
X H. H.	♂	10 "	20.7	30	177½	2½:1		Ev. 2 wks.	None	No attacks 15 wks. on diet, then grips & weakness and 30 of G.S.N. by I.M.S. Result 2 convulsions within the wk.
XI J. P.	♂	2 "	18	11	87	3:1	5 mos	4 wkly.	None	No convulsions for ½ mos. 3:1 diet not followed accurately at home.
XII C. C.	♀	13 "	21	50	213	3:1	6 mos.	Ev 4 mos		No convulsions for 7 mos. Heavy acetone test for 10 mos.

similar to those obtained by Helmholtz at the Mayo Clinic (Proc. American Pediatric Society 1926). He feels that a symptomatic cure can be expected in at least one-third of the cases of epilepsy of childhood. The impression obtained from our series is that an even greater number of cures may result especially when the technique and methods of treatment are perfected. It also seems clear that those patients who are not completely cured symptomatically are greatly improved in many instances. The improvement is shown in the disappearance of attacks, a more normal mental outlook, and good physical health.

The difficulties of the diet in epilepsy are the same as those experienced in the treatment of diabetes mellitus, before the advent of insulin, good and bad results depending in large part upon how strictly and accurately the diet is followed. In both instances indiscretions in carbohydrates are usually followed by relapses.

#### Total Caloric

$$\text{Requirements} = 9 \times [\text{R} (\text{C} + \text{P})] + 4 \text{C} + 4 \text{P}$$

IV. The cases treated have been limited to that group of children having epileptiform convulsions of undetermined etiology.

V. The improvement of the epileptic condition and the blood chemical changes in children produced by a ketogenic diet are similar to those produced by fast.

VI. A diet sufficiently ketogenic to produce a marked ketonuria usually results in a definite improvement of epileptic symptoms.

We wish to express our thanks to the dietitians of this hospital and especially to Miss Blanche Collier and to Miss Gertrude Spitz of the Out-Patient Department, for their constant interest and help in the establishment of the Epileptic Clinic.

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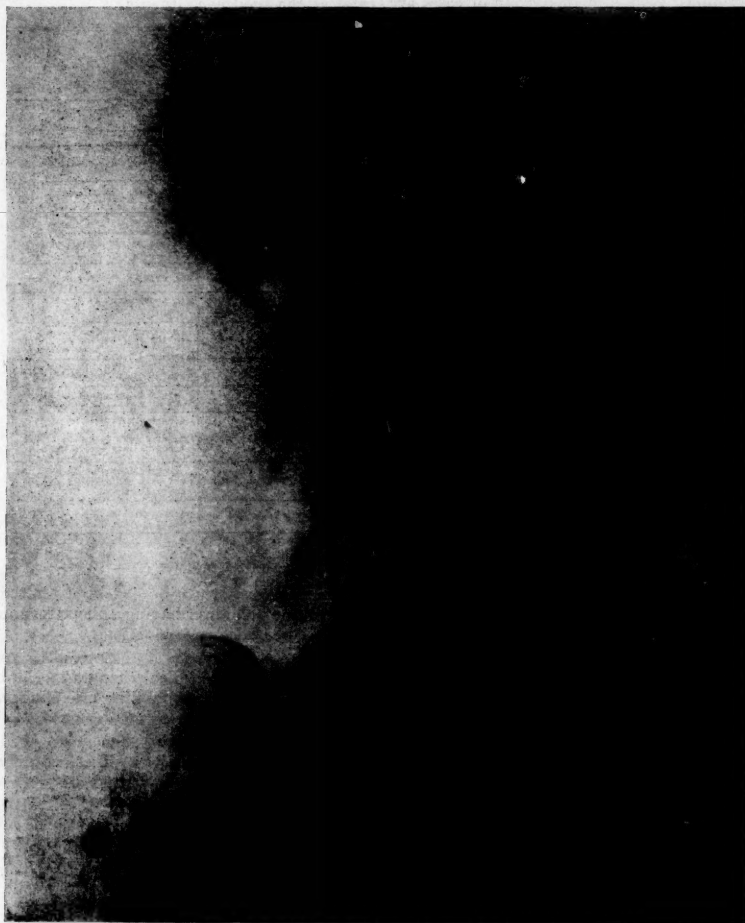
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## URETERAL OBSTRUCTION WITH ABDOMINAL PAIN AS CHIEF COMPLAINT

### Report of Six Cases

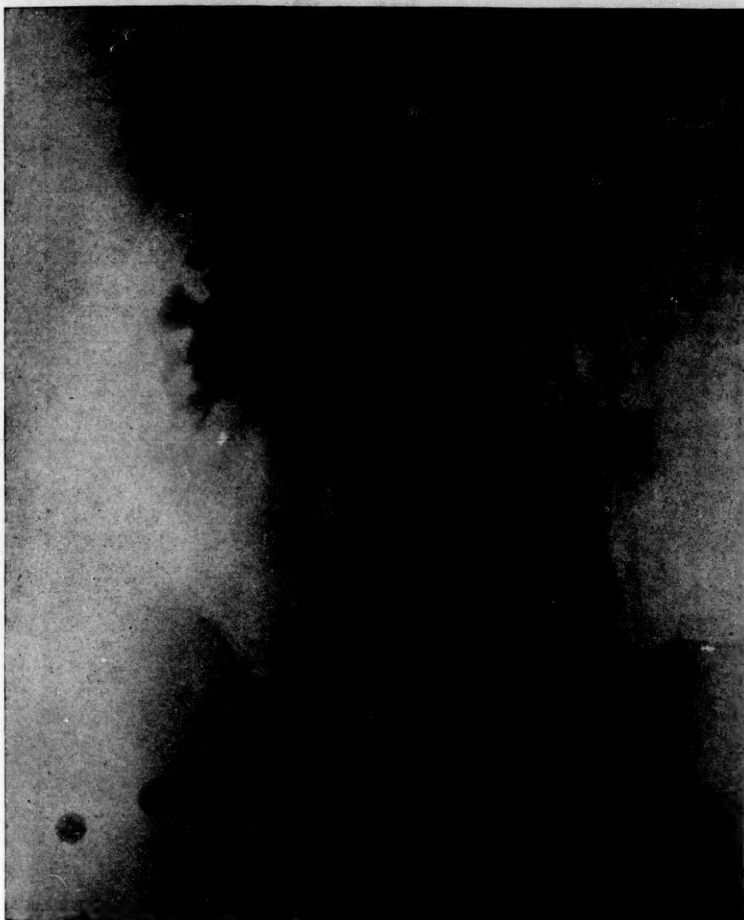
BY NATHAN FINKELSTEIN, M.D., F.A.C.S.



CASE 1. Two calculi in right kidney. Ureteral calculi did not show.

In a recent article entitled "Some Urological Causes of Abdominal Pain" (BOSTON MEDICAL AND SURGICAL JOURNAL, July 15, 1926) Barney called attention to the importance of investigating the upper urinary tract in the differential diagnosis of abdominal lesions. The cases about

sided abdominal pain for nine years. An exploratory laparotomy, five years ago, revealed nothing to account for the pain. Three months ago she noticed a mass in the right upper abdomen which had been constantly increasing in size. Four days ago, she had a chill followed by a sharp rise in temperature and had been vomiting almost continually. On examination, the patient looked extremely toxic; tempera-



CASE 1. Pyelogram shows dilatation of pelvis and calices.

to be reported will further emphasize the importance of excluding possible lesions of the urinary tract in abdominal cases which do not present a clear-cut picture.

#### CASE 1

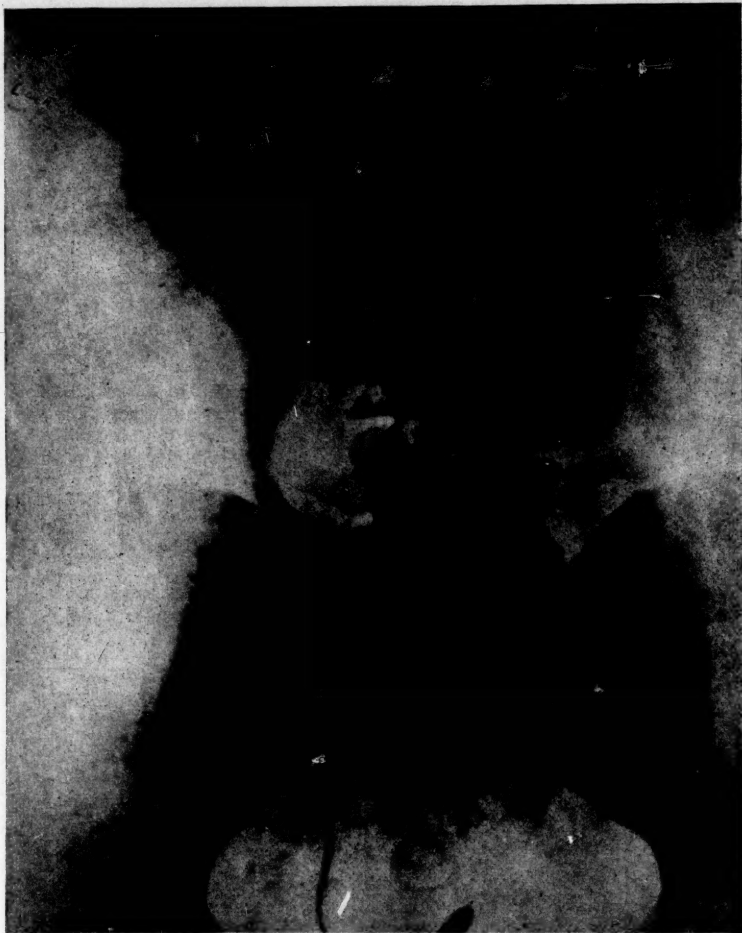
Calculous Obstruction of Right Ureter and Calculous Pyonephrosis. Expulsion of Ureteral Calculi following instrumentation. Nephrectomy.

A married woman, aged 29, had been having right-

ture 105, pulse 140, of poor quality. Abdominal examination revealed a huge, tender mass which almost filled her entire right abdomen. On cystoscopic examination the right ureter looked inflamed, edematous, and was found to be obstructed in its intramural portion; only the smallest size bougie could be passed by the obstruction. A plain radiogram showed two calculi in the right kidney but none in the ureter. Several hours after the cystoscopic examination she passed a large quantity of purulent urine and the temperature dropped to 100. The following day

her condition was much improved and she expelled, painlessly, two calculi each about the size of a kidney bean. The tumor began to diminish in size and at the end of two weeks it could not be felt. She had no more pain and the ureter was now patent. Her general condition, however, was not good and the

tent attacks of sharp colicky pain in the right abdomen, occasionally referred to the right loin, for the past three months. Two weeks ago he began to have chills, fever, nausea and vomiting. There have been no bladder symptoms. Radiograms of the kidneys and urinary examination were negative. On abdom-



CASE 2. Marked dilation of ureter above point of obstruction

right kidney was nearly functionless. Three months later I removed her right kidney, which was small and firmly adherent. Examination of the specimen showed a pyonephrotic kidney containing two calculi. The recovery was uneventful and she was discharged in 15 days.

#### CASE 2

Stricture of Right Ureter with Closed Pyonephrosis. Nephrectomy.

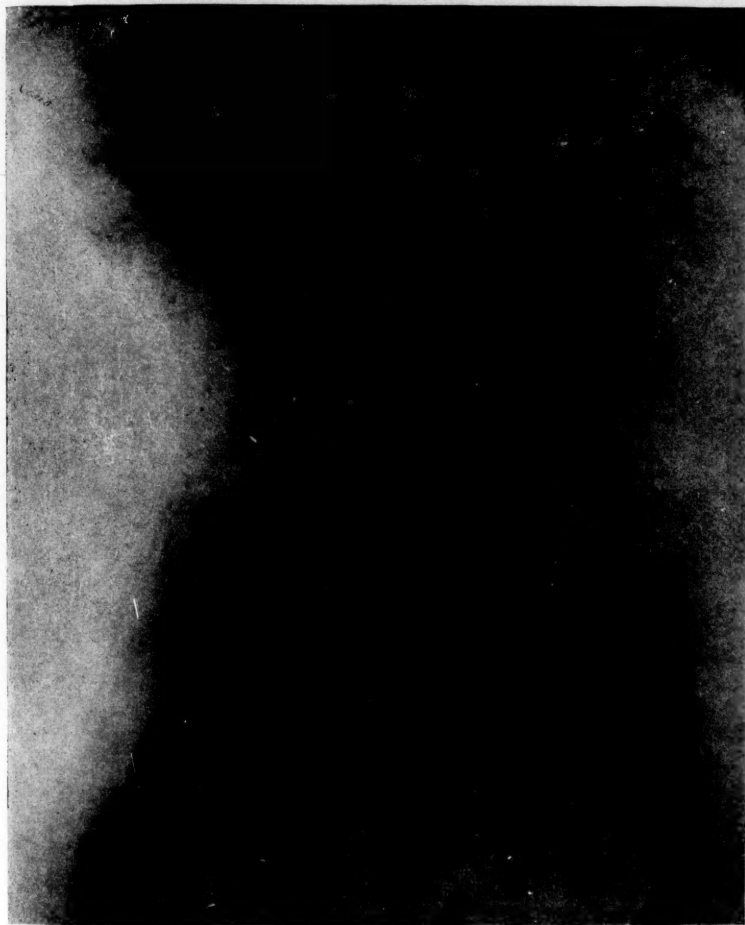
A man, aged 50, had been complaining of intermit-

inal examination the right kidney was found enlarged and tender. Cystoscopic examination revealed an obstruction about 18 cm. from the bladder. A steady drip of very turbid urine (75 cc.), containing pus and blood, was obtained. Uretero-pyelography showed marked dilatation of the ureter above the point of obstruction. After considerable effort, the catheter was pushed through the stricture and was passed up into the pelvis. A pyelogram was made, using 40 cc. of sodium iodide without eliciting any



pain. The pelvis was dilated and the lower calices partially obliterated. The function was negligible. At operation the kidney was found to be twice the normal size and firmly adherent. Subcapsular nephrectomy was performed. The vascular pedicle and ureter were surrounded by a dense sheath of inflammatory tissue. The pedicle was clamped, including

lower quadrant for the past 18 months. During the past three months the attacks had been so severe and so frequent that he was obliged to quit work. On abdominal examination the left kidney was somewhat enlarged and there was tenderness in the left lower quadrant and left costovertebral angle. The urine contained a few leucocytes and an occasional red cell.



CASE 2. Dilatation of pelvis and partial obliteration of lower calices.

the ureter, and the clamp was left on for four days. Examination of the specimen showed pyonephrosis. No evidence of tuberculosis was found. The recovery was uneventful and the patient was discharged in 18 days.

#### CASE 3

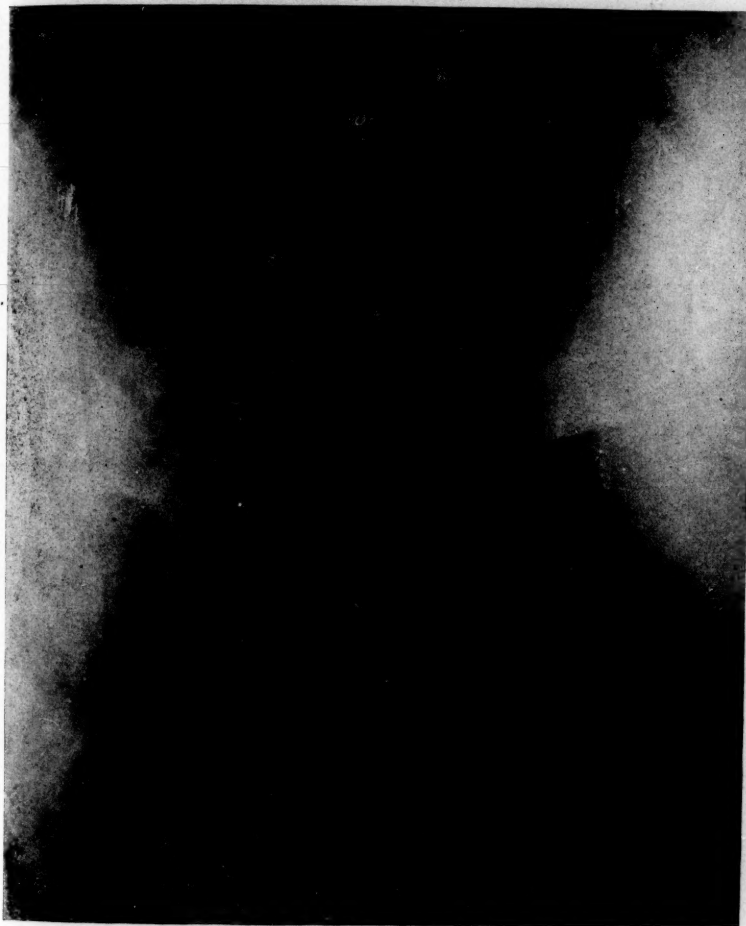
Stricture of Left Ureter with Hydroureter, Hydro-nephrosis and Renal Calculus. Nephrectomy.

A man, aged 28, had been having pain in the left

On cystoscopic examination an obstruction was found at the vesical end of the left ureter. Ureterogram showed dilatation above the point of obstruction. He was cystoscoped again and this time a small catheter was passed up into the pelvis; 30 cc. of solution injected into pelvis elicited no pain. The pyelogram showed a dilated pelvis and dilated upper ureter. The shadow in the left renal area shown in a plain radiogram was within the injected pelvis. Because of the impaired function of the left kidney and the



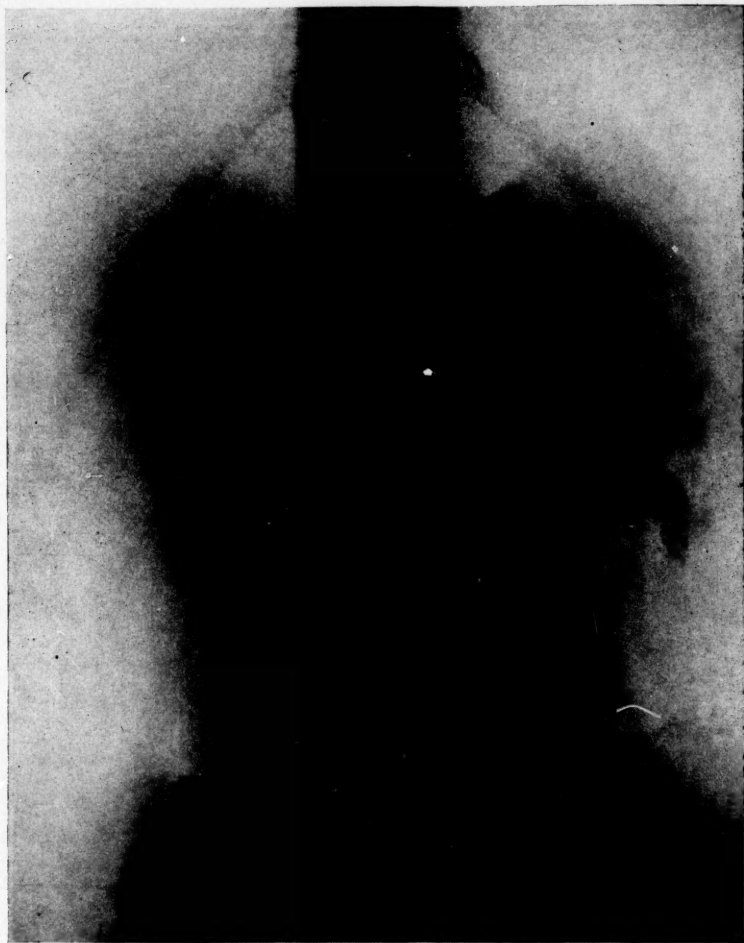
CASE 3. Shadow in left kidney area. Ureteropyelogram of right (normal) kidney.



CASE 3. Marked dilatation of lower ureter.

difficulty experienced in dilating the stricture, nephrectomy was performed. At operation the kidney was found to be about one-half again the normal size and the pelvis and upper ureter were considerably dilated. Examination of the specimen showed a hydronephrotic kidney containing a calculus. He made an

nothing was found. Ever since she could remember there had been a constant dull ache in the left lower quadrant and attacks of sharp colicky pain at irregular intervals. During the past two years these attacks had been quite frequent and had been accompanied by nausea and vomiting, chills and fever.



CASE 3. Catheter passed through stricture, kidney injected showing dilatation of pelvis and upper ureter. Shadow of calculus included in injected pelvis.

eventful recovery and was discharged at the end of two weeks.

#### CASE 4

Calculous Obstruction of Left Ureter; 25 years' duration. Extraperitoneal Uretero-lithotomy.

A single woman, aged 30, had been having pain in the left lower abdomen since she was 5 years old. At the age of 12 a laparotomy was performed and

There have been no bladder symptoms at any time. For the past five years her health has been poor. On abdominal examination the left kidney could not be felt, but there was tenderness in the left lower quadrant. On cystoscopic examination an obstruction was met 7 cm. from the bladder; the obstruction was passed with difficulty and the pelvis was injected with 10 cc. of sodium iodide. The pyelogram showed blunting of the calices but no dilatation of the pelvis.



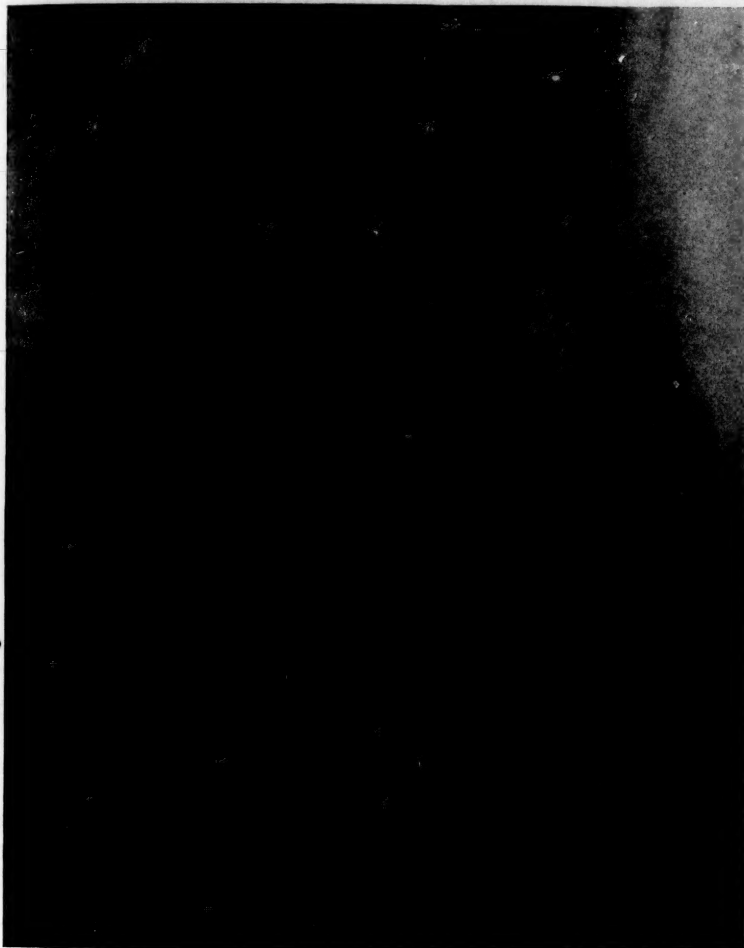
The function of the kidney was surprisingly good. The left kidney urine contained pus, blood and colon bacilli.

Through a Gibson incision I exposed the left ureter and found it surrounded by inflammatory tissue at the site of the stone. An attempt was made to push

CASE 5

Calculous Obstruction of Right Ureter, eight years' duration. Expulsion of stones following instrumentation.

A man, aged 42, had been complaining of attacks



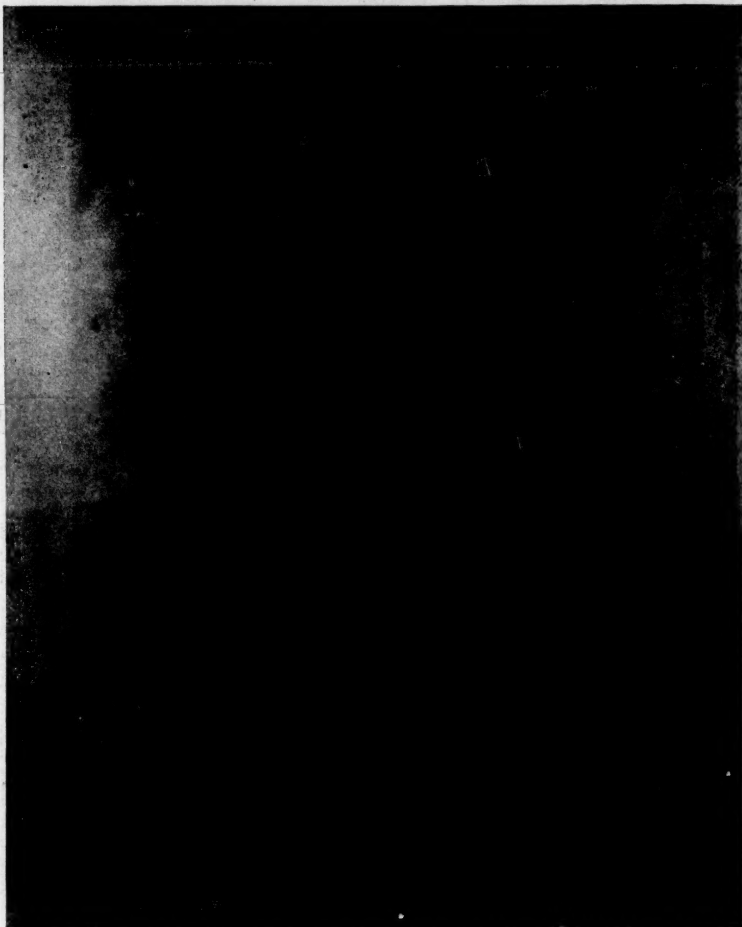
CASE 4. Large calculus in lower ureter.

the stone up, but without success. An incision was made over the stone and with gall stone forceps the stone was removed. The ureter was closed with interrupted sutures of fine catgut and a cigarette drain was placed down to the ureter. The cigarette was removed on the fifth day. The recovery was uneventful, no leakage of urine at any time. Patient discharged in 17 days.

of sharp colicky pain in the right lower quadrant accompanied by vomiting, dating back eight years. Four years ago appendectomy was performed without relief. While convalescing from his operation he had two attacks of severe abdominal pain. There had never been any pain referred to the kidney or any bladder symptoms. Examination of the abdomen during an attack showed tenderness and moderate

amount of spasm over the right lower quadrant. The urine showed some red cells and leucocytes. On cystoscopic examination the ureter was found to be obstructed at the vesical end. Radiogram showed two calculi. At another sitting the obstruction was passed, the kidney pelvis was injected and found to be nor-

mal. After several ureteral dilatations he passed both calculi. was 3 years old. During the past three years the attacks had been so frequent and had lasted so long that she was obliged to quit school. There had been no pain referred to the kidney or any bladder symptoms. Examination showed a poorly developed and poorly nourished child. Abdominal examination and



CASE 4. Catheter passed beyond calculus. Pelvis injected shows no dilatation.

mal. After several ureteral dilatations he passed both calculi.

#### CASE 6

Calculus Obstruction of Left Ureter, eight years' duration. Expulsion of stones following instrumentation.

A female child, aged 11, had been having attacks of colicky pain in the left lower quadrant since she

urinary examination were both negative. On cystoscopic examination an obstruction was encountered at the vesical end of the left ureter. The obstruction was passed with difficulty and 15 cc. of urine were obtained in a constant drip. The urine from the left kidney contained a few leucocytes but no organisms. A plain radiogram taken previously showed a calculus in the lower left ureter. Two days after catheterization of the ureter the child had several severe at-

tacks of pain accompanied by nausea, vomiting and fever. The stone was expelled after three days, during which time she had had about eight attacks.

SUMMARY

This small series of case histories, given in brief, brings out the following important points:

3. Stricture of the ureter, while not as common as some urologists claim, occurs with sufficient frequency to merit more careful study by means of ureterograms.

4. Cases 1, 5 and 6 of this series illustrate the value of the ureteral catheter as a therapeutic agent as well as a diagnostic aid. In



CASE 5. Two small calculi in lower right ureter.

1. Abdominal pain may be due to lesions of the ureter or kidney.

2. A negative plain radiogram, negative urinary findings and absence of bladder symptoms do not exonerate the urinary tract from being the seat of the trouble. Further evidence through the medium of cystoscopy and ureteropyelography is necessary.

cases 5 and 6 the stone was incarcerated in the ureter for years and they were both relieved of their trouble by this comparatively simple procedure. Case 1 was transformed from a desperately sick patient into a fairly good operative risk.

5. In three of the six cases reported, un-

necessary abdominal operations had been performed.

of pain for the relief of which a major operation had been performed. Such a mistake, however,

6. While in the majority of cases no serious

ever, is not always devoid of serious conse-



CASE 6. Calculus in lower left ureter.

harm results from the removal of a normal appendix, in the presence of a ureteral calculi it must be embarrassing to the surgeon to attempt to explain the persistence of the same attacks

quences. The writer has in mind a case that had been operated on for appendicitis. He continued to have attacks of abdominal pain and died in a week of Calculous Anuria.



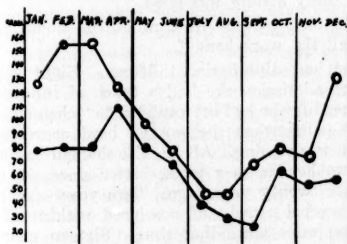
A NOTE ON THE COMPLICATIONS OF PNEUMONIA IN  
INFANTS AND CHILDREN\*

BY LEWIS WEBB HILL, M.D.

IN going over for another purpose the records of a large number of cases of pneumonia from the Infants' and Children's Hospitals, note was made of the complications, in order to determine their relative frequency in infants under two years of age, as opposed to children over two. Note was also made of the yearly variations in the incidence of the two most common complications, otitis media and empyema, and the monthly incidence of pneumonia in the two institutions. The records cover the years 1915-1925 inclusive, and represent nearly two thousand cases.

CHART I

THE MONTHLY INCIDENCE OF PNEUMONIA (1961 CASES)  
(The upper curve for the Infants' Hospital, the lower for the Children's)



As can be seen from the table, otitis media is a very common complication, empyema a moderately common one. Delayed resolution occurs occasionally in children, and pyelitis and

\*From the Infants' and Children's Hospitals, Boston, and the Department of Pediatrics, Harvard Medical School.

acute nephritis in infancy. All other complications are very rare.

If the yearly incidence of the two most common complications is tabulated, it is seen that

TABLE 2  
COMPLICATIONS

Infants' Hospital		Children's Hospital	
Number of cases—1187		Number of cases—774	
Age—Up to 2 years		Age—Between 2 and 12 years	
Otitis media	341=28%	Otitis media	119=15%
Empyema	47= 4%	Empyema	43= 5%
Pyelitis	24= 2%	Unresolved	16= 2%
Acute nephritis	12= 1%	Acute nephritis	2 cases
Unresolved	5 cases	Pyelitis	1 case
Infectious diarrhea	5 "	Lung abscess	1 "
Pneumococcus meningitis	5 "	Pneumothorax	1 "
Retropharyngeal abscess	5 "	Influenza meningitis	1 "
Influenza meningitis	4 "	Pneumococcus meningitis	1 "
Erysipelas	4 "	Peritonitis	1 "
Peritonitis	3 "	Purulent pericarditis	1 "
Purulent pericarditis	2 "	Myocarditis	1 "
Dry pericarditis	2 "		
Encephalitis with hemiplegia	2 "		
Pyopneumothorax	2 "		
Pleural effusion (sterile)	2 "		
Lung abscess	1 case		
Endocarditis	1 "		
Pneumothorax	1 "		

there is a very considerable variation from year to year, due probably largely to the type of organism that is prevalent at that particular time.

TABLE 3

YEARLY VARIABILITY OF OTITIS MEDIA AND EMPYEMA (IN PER CENT.)

	Otitis Media											
	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	Average
Children's	10	8	24	6	17	45	6	18	16	16	4	15
Infants'	11	20	60	23	24	25	31	38	45	14	15	28
	Empyema											
	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	Average
Children's	5	3	8	6	5	.60	8	4	8	5	6	5
Infants'	5	7	7	4	.75	.60	.90	4	.00	11	5	4

**Case Records**  
of the  
**Massachusetts General Hospital**

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN  
WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.  
F. M. PAINTER, A.B., ASSISTANT EDITOR

**CASE 13031**

**EPIGASTRIC PAIN AND VOMITING  
TWENTY YEARS AFTER REMOVAL OF  
A BREAST TUMOR**

**MEDICAL DEPARTMENT**

A Nova Scotian widow sixty-three years old entered October 22 complaining of pain in the region of the right breast. Because of her faulty memory and great indifference to her condition the history is not reliable.

She dated her present illness back twenty years to the time of an operation for removal of a tumor from the right breast. This began as a hard, tender lump the size of a marble, which increased rapidly in size until at operation it was as large as a hen's egg and very tender, painful and hard. From that time until two years before admission she had some discomfort and pain in the region of the scar on fatigue. Her bowels, which had previously been regular, required a cathartic once or twice a week after the operation. Two years before admission her right arm began to show weakness which gradually increased until she now felt that it was considerably weaker than the left. At the same time her constipation began to increase progressively until she now had a movement only every second or third day. She believed that there had occasionally been a little blood in the stools and that they looked dark, but not tarry, at times. During the past two years she had vomited rich or fatty foods, after a feeling of nausea and sharp gripping epigastric pain. The pain was relieved by the vomiting. Sixteen months before admission for two days she had half a dozen attacks of sharp lancinating pain in the lower abdomen which made her double up and break into a cold sweat. This came and went at intervals of a few seconds for fifteen minutes. The attacks had no relation to meals or time of day. A year before admission she began to have a dull discomfort in the abdomen, and the pain in the right breast on fatigue would travel down to the epigastrium. She

would feel weak and nauseated. For the past year she had had considerable gas in the stomach, especially after supper. Six months before admission the pain in the breast became more severe, knife-like and shooting, making her catch her breath, and occurred more frequently. Three weeks before admission she had her few remaining teeth extracted. After this she felt ill and went to bed for a week, vomiting once every afternoon. The vomitus was never bloody or dark. Two weeks ago she got up and tried to work, but was too weak. Since that time she had been unable to do anything but a little housework. For two days she was in bed with a cold. Coughing brought on the chest pain. She thought she weighed 250 pounds two years before admission and that she had lost a good deal of weight, especially during the past three weeks. She had pain in her lower back after she did a hard day's washing. She believed that she had been slightly yellow several times during the past twenty years, not more than once a year. She thought these attacks had not been more severe or frequent. The last one was a year ago.

Her mother died of heart disease; otherwise her family history was good.

She took lodgers in a nine-room house and did all the work herself.

She had diphtheria at fifteen. Eight years before admission she had a touch of influenza. All her life she had been subject to "rheumatic" joint pains when she worked hard or when a storm was coming. All her life she had had one or two headaches a week, better since she got glasses twenty years ago. Two years ago she had several attacks of nosebleed within a few weeks; none since that time. Sixteen months ago and again three months ago she had an itching scaly rash over her whole body. For years she had urinated once or twice at night. Her memory was very poor. She was never sure whether her symptoms developed two or twenty years ago.

Examination showed an obese, senile woman showing evidence of loss of weight, with pinpoint and linear excoriations over the entire body. The lungs were clear. The location of the apex impulse of the heart is not recorded. The left border of dullness was 10.5 centimeters from midsternum, 1.5 centimeters outside the midclavicular line; no other enlargement to percussion. The sounds were of fair quality. The action was regular. There were no murmurs or thrills. The radials were thickened, the brachials tortuous. The blood pressure was 145/80. The abdomen was very obese and showed slight epigastric and bilateral lower quadrant tenderness. There were umbilical herniae. The right leg was slightly larger than the left. Both showed evidence of old varicose ulcers, but very

slight superficial varices showed at present. The pupils were sluggish. The ankle-jerks were normal. The knee-jerks are not recorded.

The amount of urine is not recorded, specific gravity 1.014 to 1.018, a very large trace of albumin at one of two examinations, occasional leucocytes at both sediment examinations. She was incontinent, therefore a renal function test could not be done. Blood examination showed 14,000 leucocytes, 88 per cent. polynuclears, hemoglobin 60 per cent., reds 3,150,000, moderate achromia. Non-protein nitrogen 300 to 333 milligrams. Wassermann negative. Stool: guaiac negative; no occult blood. Gastric analysis: fasting contents, 50 cubic centimeters of bile-stained slightly viscid material, guaiac possibly slightly positive, no occult blood, no free hydrochloric acid, total acidity 35 (??). Test meal, 67 cubic centimeters of pale watery material with a slight trace of bile, one small blood clot, many food particles, guaiac moderately positive, no free hydrochloric acid, total acidity 20.

X-ray of a barium enema showed that the colon filled without delay. No defects. Fluoroscopic examination of the chest revealed fixation of the left diaphragm. The right diaphragm appeared to move normally. A film showed the left diaphragm high. Respiratory excursion was absent. The left costophrenic sinus was cloudy, and there was some cloudiness at the left base. The heart shadow appeared to lie somewhat to the left. The right border was behind the spine. The upper portion of the left lung field was clear. The right lung field and diaphragm were normal. A barium meal showed the stomach in the high transverse position. It was impossible to palpate. There was a medium six-hour residue. The patient refused to take more than a few swallows of the barium meal, so that the examination was made under great difficulties. The stomach was apparently normal with the exception of the prepyloric region, which appeared narrow and over which peristalsis did not seem to pass. The duodenum was unusually large. No defects noted in this region. The head of the barium meal was in the cecum.

A skin consultant reported, "The pigmentation and the grouping of the lesions suggest dermatitis herpetiformis. No evidence of scabies."

The temperature and respirations were not remarkable. The pulse was 84 to 115.

The patient was fairly comfortable, but became increasingly stuporous. October 26 she was incontinent of urine and feces. Fluids were forced. Toward evening on October 28 her condition was much changed. She became rapidly more stuporous and asthenic. In the evening she showed air hunger, went into coma and died.

## DISCUSSION

BY RICHARD C. CABOT, M.D.

### NOTES ON THE HISTORY

We might begin to think of the possibilities of pain in the region of the right breast twenty years ago. If it was cancer would it sound like this history?

A STUDENT: I think the tenderness and pain are against cancer.

DR. CABOT: Yes, it would be unusual in the face of tenderness and pain.

"During the past two years she had vomited rich or fatty foods, after a feeling of nausea and sharp gripping epigastric pain." What is the difficulty in that sentence? We want to know how often it occurred,—twice in two years or every day. No one should take a history in that form. Is that an occasional event or a common event? Is it increasing in frequency?

MISS PAINTER: She had it whenever she ate rich or fatty foods.

DR. CABOT: Of course we do not know how often she ate them. Apparently she got this trouble as often as she did eat them, but how often?

Several statements are made here to show that it is a severe pain. A pain that doubles a person up is more severe than a pain that does not. In the absence of a pain thermometer we ask, Does the pain keep you awake? Does it keep you away from work? Does it double you up? Have you had to take morphia for it?

The pain caused her to break into a cold sweat. The "cold" does not tell very much. It means that she did not have fever at the time. The sweating does show severity of the pain.

This is all in a period of two days sixteen months ago. It does not seem to have recurred.

"The pain in the right breast on fatigue would travel down to the epigastrium." I suppose that means she felt it first in the breast and later in the epigastrium on the same occasion of fatigue.

When people complain of gas it is not that they form gas in the stomach in any considerable quantity. The so-called gas that is there is atmospheric air, not any particular product of fermentation. When a person complains of "gas" it ordinarily means that the pylorus does not let it pass down, therefore it comes up at the cardiac end. If this is contracted too the stomach becomes distended and painful. That is important to get clear. The normal person is passing air out of the stomach at the cardiac end and the pyloric end.

The teeth were extracted I suppose for the pain in the epigastrium. The two do not seem very closely connected, but that is what happens.

"She believed that she had been slightly yel-

low several times during the past twenty years." I find on taking histories and checking them up that that is one of the most misleading statements patients ever make. This statement about being yellow is taken to mean jaundice. When patients say it was present usually their friends have remarked about it and mean somewhat sallow. If we ask them if their eyes were yellow they either say they do not know, or that they were not. We can not trust patients' accounts about jaundice unless they noticed it in the staining of the clothes with urine or by sweat.

"All her life she had been subject to 'rheumatic' joint pains, when she worked hard or when a storm was coming." Of course we cannot make anything out of a lesion that has gone on so long as that. We cannot call it rheumatism in the sense that it is connected with endocarditis.

"For years she had urinated once or twice at night." We do not know how many years. It might be a habit, which of course means nothing. Many people get it as they get any other habit and keep it up all their lives. On the other hand if it arises for the first time in an elderly person we think of heart or kidney disease.

"She was never sure whether her symptoms developed two or twenty years ago." That is rather disquieting to us. We should like to know.

Now let us see what we get out of the history. The last paragraph does not seem to help us much. We have to deal with this pain in the breast and abdomen which has been going on either two or twenty years, or something in between, which has been accompanied by vomiting, possibly jaundice,—but we do not know that,—which has not caused loss of weight until lately, which has allowed her to do her work until lately, and which has not been associated in any way with relief by food or soda apparently, as ulcer pains are, and which seems to be in a considerable number of different places. I certainly cannot make any guesses that amount to anything on the basis of that. I am trusting to the physical examination to clear up what is so far dark to me.

#### NOTES ON THE PHYSICAL EXAMINATION

"Pin-point and linear excoriations over the entire body." Remember that she had had an itching scaly rash. If it wasn't for that rash we should begin to wonder if she had scratched on account of jaundice.

What would you say as to that account of the circulatory system?

A STUDENT: It suggests arteriosclerosis.

DR. CABOT: Yes. As a cause of symptoms in this case? I do not say so. I believe it is not

at all likely that the circulatory system has anything to do with this case. We can imagine embolism or thrombosis of the coronaries, but I do not think it is likely. It is quite likely that the heart is a little enlarged, as it reaches one and a half centimeters outside the midclavicular line and also has a slightly raised systolic pressure. At her age it would be a pretty good bet anyway that the heart is enlarged. So far there is no evidence of passive congestion.

We do not seem to get much out of the abdomen so far, or from the examination of the lungs.

What was the probable condition of the kidneys?

A STUDENT: Arteriosclerotic kidneys.

DR. CABOT: Yes; I should say that whatever the urine showed, on the strength of her age and arteriosclerosis elsewhere. But this urine in itself does not give any evidence of disease.

The blood examination shows a slight leucocytosis and an anemia which to me is the most important single fact we have yet. It must be certain that the disease has been going on some time. She has lost two-fifths of her blood corpuscles. So we can begin by asking the cause of that loss. What are the causes of a moderate degree secondary anemia in a woman of sixty-three? We will come back to that.

A STUDENT: How about that non-protein nitrogen of 300 to 333 milligrams?

DR. CABOT: That is quite astounding. I take back what I said about the kidney.

Now as to the stomach, what about that blood clot in the stomach?

A STUDENT: It might be just due to the vomiting.

DR. CABOT: Yes, or what else?

A STUDENT: It might be carcinoma or ulcer.

A STUDENT: It might be from the tube itself.

DR. CABOT: Half the time we used to see a little blood from the use of the tube, especially the old fashioned rubber tube, the kind that traumatizes the stomach.

The important fact is the absence of hydrochloric acid in the fasting contents or in the test meal. What does that indicate?

A STUDENT: I do not know that it indicates much of anything.

DR. CABOT: Nothing at all?

A STUDENT: It suggests carcinoma of the stomach.

DR. CABOT: What else?

A STUDENT: Pernicious anemia.

DR. CABOT: Pernicious anemia does it of course.

A STUDENT: It may be present in old age.

DR. CABOT: Yes. A good percentage of adults have achlorhydria. It doesn't necessarily mean anything. But we get it more often



in the two diseases mentioned than in any others.

They apparently did not do anything with the stomach. Perhaps we shall find out later.

The trouble shown in the X-ray is much more apt to be due to something below the diaphragm than above. Pleural adhesions above might fix the diaphragm, but ordinarily it is something below fixing it in a high position. They are working, as they say, under great handicap trying to find out whether this is cancer of the stomach, and of course we have to be able to get at the patient very well to be sure about that,—to feel the stomach with the hand and to watch very carefully the passage of the peristaltic wave over every part of it. They are suspecting cancer in that stomach, but are not sure.

#### DIFFERENTIAL DIAGNOSIS

Now I imagine the two things that are in your mind are cancer of the stomach and chronic nephritis. Either of those would account perfectly well for the secondary anemia that we have. Either of them would account for the vomiting. Would either of them account better for the pain than the other?

A STUDENT: Cancer.

DR. CABOT: Yes, cancer. You do not look for pain in any considerable amount in pure uremia. Another point against uremia is the relatively low blood pressure. It is queer that there should be an essentially normal blood pressure with the non-protein nitrogen as high as that. Are there any other points against nephritis?

A STUDENT: You would expect more edema. DR. CABOT: You do not always get it. You expect it. It is a strange thing, if this woman turns out to have it, first that the heart is not bigger and the blood pressure higher, second that there is apparently no edema.

A STUDENT: Does her mental state at the end go all right with kidney trouble?

DR. CABOT: I should say so. But that and the high non-protein nitrogen are about all we have to go on.

A STUDENT: Dr. Cabot, when you get a history in which the patient has a poor memory what do you do in a case like that? Most of her history she dates either twenty or two years ago.

DR. CABOT: You have to make the best guess you can. You are at a great disadvantage of course, but there is nothing else to do.

A STUDENT: If it began only two years ago it might very well be a return of malignancy.

DR. CABOT: It could not be metastasis in the stomach. It might have been a local recurrence. But your point is a perfectly good one. We cannot reason accurately on a case like this.

A STUDENT: Couldn't it be metastasis from the breast to the stomach?

DR. CABOT: I have never seen one. Have you, Dr. Mallory?

DR. MALLORY: I do not know that I have.

A STUDENT: Osler says it can.

DR. CABOT: It must be if he says so.

A STUDENT: He says that thirty-three out of a hundred and fifty cases metastasized from the breast to the stomach.

DR. CABOT: That surprises me very much.

A STUDENT: There is another place that says seventeen out of thirty-seven stomach cancers will metastasize in the breast.

DR. CABOT: In both cases I am very much surprised.

A STUDENT: What do you think she had in the breast?

DR. CABOT: I think the chances are that it is cancer, for the reason that it was painful and tender.

A STUDENT: Perhaps it was not so painful as she thought it was.

DR. CABOT: That is possible, but we have to argue on something.

A STUDENT: Might not the pain she had had with fatigue be perfectly compatible with cancer, since we know it was very rapidly growing? That would give pain whether it was malignant or not, wouldn't it?

DR. CABOT: Yes. We do not know how long that interval was. It went from the size of a marble to a hen's egg between the admission and operation. We do not know how long,—merely her statement.

A STUDENT: Isn't the large trace of albumin significant of nephritis?

DR. CABOT: If she has uremia. But I should not have considered the kidney if it had not been for that account of the non-protein nitrogen. Sometimes accidents do happen. Somebody else's urine might have got reported. We have to consider that possibility. I should like more than one report.

A STUDENT: Physical examination makes no record of any scar. Do you think the patient had an operation?

DR. MALLORY: I can answer that. There was a very large scar on the right breast extending away into the axilla. The entire breast was amputated.

A STUDENT: How about the possibility of cancer of the kidney?

DR. CABOT: What suggests that?

A STUDENT: The long duration.

DR. CABOT: You are thinking of that as accounting for the high non-protein nitrogen

A STUDENT: I suspect that.

DR. CABOT: I am not considering cancer of the kidney. I do not think it should be considered.

A STUDENT: Might any biliary trouble be considered? Cholelithiasis?

DR. CABOT: It does not sound to me much like gall-stones.

A STUDENT: Was that breast pain referred from the stomach?

DR. CABOT: I think not. I never heard of such a case.

On the whole it seems to be more like gastric cancer than anything else. I shall bet on that. She may of course have gastric cancer plus chronic nephritis, and I feel a little skeptical about voting either way on that. There is nothing else except the non-protein nitrogen as the one fact that makes me think of nephritis.

A STUDENT: How do you account for this high diaphragm?

DR. CABOT: I have not accounted for it. That sounds more like a kidney tumor, a hydro-nephrotic cyst closed in such a way that nothing showed in the urine. It seems strange however that nothing should be felt under the left ribs.

A STUDENT: Would a polycystic kidney give a high diaphragm?

DR. CABOT: Yes; on both sides in all probability. The polycystic kidney does give a high non-protein nitrogen and a high diaphragm. But I have never seen a fatal one that was not palpable below the ribs and on both sides.

A STUDENT: She weighed 250 pounds.

DR. CABOT: She did weigh that? She shows marked loss of weight. It does not say how much. What was your impression, Dr. Mallory, as to nutrition?

DR. MALLORY: She was still a stout woman, but not particularly obese.

A STUDENT: Is polycystic disease rare?

DR. CABOT: Yes; I should say so.

A STUDENT: Do you ever get cases of acute terminal pleuritis, like pericarditis, with a chronic nephritis?

DR. CABOT: The form of pericarditis that you get is ordinarily an acute form at the end of life. A terminal rather than a chronic adhesive pleurisy is very common in all sorts of diseases, and it may so far as I know give us this high diaphragm, though I am inclined to think not.

I think I shall stick to cancer of the stomach. I do not account for the high diaphragm on the left. I do not account for the high non-protein nitrogen. It is perfectly possible that there is a chronic nephritis. We are under very great difficulties on account of the unsatisfactory history.

A STUDENT: Do you consider the cancer primary or metastatic?

DR. CABOT: I am considering it primary.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Chronic nephritis.

Carcinoma of the stomach?

Dermatitis herpetiformis.

#### DR. RICHARD C. CABOT'S DIAGNOSIS

Cancer of the stomach.  
Possibly chronic nephritis.

#### ANATOMICAL DIAGNOSIS

##### 1. *Primary fatal lesion*

Subacute glomerulonephritis.

##### 2. *Secondary or terminal lesions*

Arteriosclerosis.

##### 3. *Historical landmarks*

Mastectomy.

Chronic adhesive pleuritis.

Chronic cholecystitis and cholelithiasis.

DR. MALLORY: The case, as far as we can make out, is entirely one of chronic nephritis and nothing else.

On the chest there was an old operative scar running from the area of the right breast into the axilla. Practically all the breast, including the nipple, had been removed. There was no induration of the scar and no evidence of local recurrence in it or beneath it.

The stomach showed a mucosa somewhat thickened, and grayish green in color. The musculature at the pylorus was rather thicker than normal, but no ulcers and no tumor.

The lungs showed large areas of atelectasis at the left base, and there was a chronic adhesive pleuritis at that place.

The heart weighed 360 grams, which is probably slight hypertrophy, but the cardiac muscle appeared normal. The cavities and valves were negative. The left coronary artery showed a small point of calcification which partially obstructed the lumen, but not completely. The aorta showed very marked sclerosis.

The liver weighed 1935 grams, much enlarged, brownish in color. The markings were indistinct,—the typical appearance that used to be described as "cloudy swelling."

The gall-bladder showed a slightly thickened wall and contained innumerable stones from two millimeters up to one centimeter in diameter. The cystic duct was obstructed by one such stone, the common and hepatic ducts by three.

The kidneys weighed 385 grams, which is a slight but definite enlargement. The capsules stripped fairly readily, leaving a smooth surface. On section however the cortex averaged only two and a half to three millimeters in thickness, whereas the normal width is about five millimeters. The consistency of the entire kidney seemed to be firmer than normal. Although the patient was anemic most of the organs were practically normal in color, whereas the kidneys were very much paler, a sort of yellowish white. Microscopic sections of the

kidneys showed the essential lesion was in the glomeruli. Some of them were completely sclerosed, perhaps ten or fifteen per cent. The other glomeruli were rather diffusely affected, showing a proliferation of the capillary endothelium, an increased number of nuclei, and a considerably smaller number of red cells than you ordinarily see. About the areas of sclerosed glomeruli of course there were large areas of tubular atrophy and infiltration with lymphocytes and plasma cells. I should interpret the kidney as being between an acute and a chronic stage of glomerulonephritis. They are kidneys that were probably much bigger a year and a half ago, and are now shrinking down. If the patient had lived a year or two longer they would have been greatly contracted, but they are just in the shrinking stage and are still a little bit bigger than a normal kidney.

A STUDENT: Did you account for the fixation of the diaphragm?

DR. MALLORY: I think that was caused by the pleural adhesions. There was nothing else to do it.

A STUDENT: Did the condition of the scar suggest two or twenty years ago?

DR. MALLORY: The operation was certainly twenty years ago. As far as the pain in the breast goes I should rather guess that it was just the sort of pain that everyone has in old scars. Any scar may give pain when the weather changes, which is one of the things that was mentioned in the story. I doubt if it was anything more than that.

A STUDENT: How do you interpret those peristaltic waves at the pyloric end of the stomach?

DR. MALLORY: That is beyond me.

DR. CABOT: I think the suggestion of cholelithiasis that one man made was a pretty good one. That stone stuck in the cystic duct seems to me about as good an explanation of all the pain she had as anything else.

DR. MALLORY: I think nephritis was not considered until just before death, when they happened to get that non-protein nitrogen.

DR. CABOT: Apparently other people were fooled as well as I. It was certainly a clean miss.

A STUDENT: Is there anything to account for low blood pressure with the extremely high non-protein nitrogen?

DR. CABOT: I have no explanation for it except a theoretical one. I think with those kidneys she may have had a much higher blood pressure than that recorded in the history. If they had got her three or four weeks earlier they might have found a very high blood pressure with possibly cardiac failure in the end.

## CASE 13032

### A PATIENT IN "SHOCK"

#### MEDICAL DEPARTMENT

A Canadian salesman forty-four years old came to the Emergency Ward October 16. He presented the picture of a patient *in extremis* from shock. The history was given after his death by a sister and his wife.

For many years he had had a vague and indescribable "indigestion," with gas, abdominal pains not localized, abdominal fullness and very infrequent nausea; no vomiting.

October 9 he complained of mild chilliness. He remained at work, and the following day felt much better. October 11 and 12 he vomited while at his work. Late in the afternoon October 13 he felt "sick" and that evening vomited several times. His bowels had not moved since that time. October 14 and 15 he complained of sharp pain under the right costal margin, and stayed in bed. A physician strapped his chest with little relief to the pain. The patient vomited several times on the 14th, and by the following evening was vomiting nearly every ten or fifteen minutes.

When seen in the Emergency Ward about noon on October 16 the pulse was scarcely perceptible but regular. The lips and fingers were cyanotic. The patient did not react well to questioning. The abdomen was so distended that palpation was unsatisfactory. There was tenderness. Rectal examination was negative. The blood pressure was 70/50. The patient was vomiting every ten or fifteen minutes, black sweet-smelling fluid. Air hunger was a very marked feature.

The patient was placed on a shock table, with hot water bottles around him. An enema failed to give results. A thousand cubic centimeters of normal saline was injected intravenously. The blood showed 23,000 leucocytes, 5,900,000 red cells, hemoglobin 80 to 90 per cent. The vomitus gave a positive guaiac. He was examined by two surgical consultants and a visiting physician. Donors were sent for, but before transfusion was started the patient's condition became very much worse. Soon after three o'clock he died.

#### DISCUSSION

BY RICHARD C. CABOT, M.D.

#### NOTES ON THE HISTORY

The pain was not the first symptom. It was first vomiting, then constipation and third pain. That seems important in the differentiation of a perforative peritonitis and obstruction.

"A physician strapped his chest with little relief to the pain." I think I could have done

fully as well as that. It does not seem very effective.

What more would you like to know about that vomiting?

A STUDENT: The character.

DR. CABOT: And what especially about the character?

A STUDENT: Smell.

DR. CABOT: Yes; smell is what we want to know. Smell is more characteristic than the color. Ordinarily you begin to get a stercoraceous odor in most cases of vomiting as long as this.

#### NOTES ON THE PHYSICAL EXAMINATION

"The abdomen was so distended that palpation was unsatisfactory." It does not say it was tender. It may have been. If it was tender it favors peritonitis more than obstruction.

"The patient was vomiting every ten or fifteen minutes, black sweet-smelling fluid." That is very definitely put, although a very strong adjective.

I do not see why they thought of transfusion. It would never occur to me to transfuse a man with that number of red cells.

#### DIFFERENTIAL DIAGNOSIS

I do not see how we can consider more than two things, intestinal obstruction and general peritonitis. Both of them would give pain, distension and shock with collapse, such as he is in. In favor of intestinal obstruction it seems to me is the beginning with vomiting but continuing with distension. In fact he did not have pain until the third day.

A STUDENT: Would he have a leucoctyosis in both?

DR. CABOT: Yes, you can have it in both. I do not think it helps us at all one way or the other.

A STUDENT: Would general peritonitis give vomiting as constant as he had it?

DR. CABOT: I think so.

A STUDENT: What is the relation of the odor to intestinal obstruction?

DR. CABOT: It is ordinarily foul. I never heard it called sweet in any condition such as we consider here.

A STUDENT: Might that not be due to acetone from his dehydration? He is said to have had air hunger.

DR. CABOT: It might be.

A STUDENT: Do you throw out acute pancreatitis entirely?

DR. CABOT: It is a dangerous thing to throw out. It is always a good thing to think of. The cases of pancreatitis I have seen have had pain from the first. I do not remember a case that did not have pain for several days and began with vomiting in this way. I vote against it.

A STUDENT: Could the loss of fluid possibly explain the blood counts?

DR. CABOT: I do not think he has an anemia. It would make the blood counts higher than they otherwise would be. It would not explain the leucoctyosis.

A STUDENT: Could you consider an ulcer from that perforation?

DR. CABOT: Yes, any of the causes of perforative peritonitis, such as appendicitis, perforated ulcer or gall-bladder, have to be considered.

A STUDENT: Isn't the normal red count against a perforation? If it was ulcer there would be hemorrhage with it.

DR. CABOT: You can have perforations without hemorrhage, you know.

A STUDENT: There may have been hemorrhage present.

DR. CABOT: Yes, if you interpret that black sweet-smelling fluid as blood.

When there is vomiting you often get blood in the stomach contents from obstruction or peritonitis. But I do not believe there was enough blood lost to give anemia.

With peritonitis pain is ordinarily the first thing, then distension, vomiting and the rest of it. Perforative peritonitis has ordinarily tremendous pain from the very start. If this is a peritonitis it has got to be something that came gradually, that is clear.

A STUDENT: With peritonitis of this duration would you expect the temperature to rise?

DR. CABOT: There is nothing said about the temperature.

MISS PAINTER: There is no record of it.

A STUDENT: What about his indigestion?

DR. CABOT: I cannot make anything out of that. It may have been from an obstruction.

I am going to say intestinal obstruction. If it is that, what are the probable causes?

A STUDENT: Intussusception.

DR. CABOT: Intussusception at this age isn't common.

A STUDENT: Volvulus.

DR. CABOT: Yes; a twisted bowel.

A STUDENT: Mesenteric thrombosis.

DR. CABOT: Possibly.

A STUDENT: Carcinoma.

DR. CABOT: I think that is as likely as any. The acuteness of it does not rule out carcinoma. If he has had a previous operation of course adhesions would be the first thing to think of. In the absence of that carcinoma is as likely as anything.

A STUDENT: Can you rule out a perforated appendix?

MISS PAINTER: He had his appendix taken out at twelve.

DR. CABOT: So I think we can rule that out. Of course we did not know about this appen-



dix. It ought to be in the clinical record. This is very important for our diagnosis. If he had a previous appendicitis there are probably adhesions as cause of obstruction. I think I shall bet on that on the whole, although we seem to be in difficulties on account of omissions in the history.

A STUDENT: Isn't the location of that pain wrong for an obstruction? It is on the right side. Shouldn't it be in the middle?

DR. CABOT: No, it can be anywhere, as far as I know.

MISS PAINTER: There was considerable bulging on this side.

DR. CABOT: This bulging in the sear makes you wonder whether there was enough bulging there for a strangulated hernia. I think not, though. I am betting on intestinal obstruction. I do not know any better guess as to its cause than adhesions.

A STUDENT: High or low?

DR. CABOT: I should put it low simply because that is commoner than high. I do not see any particular evidence for its being high.

A STUDENT: If it had been high would not the contents of the vomitus have smelled worse?

DR. CABOT: You get very bad smelling vomitus from obstruction anywhere, unless it is very high up.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Intestinal obstruction?  
Mesenteric thrombosis?  
Gastric ulcer?

#### DR. RICHARD C. CABOT'S DIAGNOSIS

Intestinal obstruction due to adhesions.

#### ANATOMICAL DIAGNOSIS

##### 1. Primary fatal lesion

Perforated ulcer of the pylorus.

##### 2. Secondary or terminal lesions

General peritonitis.  
Bronchopneumonia.  
Marked tuberculosis of the lungs.  
Central necrosis of the liver.

DR. TRACY B. MALLORY: When the peritoneal cavity was opened it contained a large amount of slightly cloudy fluid. The intestines were everywhere coated and matted together with thick fibrinous exudate. The stomach and duodenum were very much distended. The pyloric region of the stomach and first portion of the duodenum were tightly glued to the under surface of the liver with thick fibrinous exudate. After separating these a clean-cut perforation about half of a centimeter in diameter was seen on the anterior aspect of the pyloric ring. There

were also two small ulcers on the posterior side of the duodenum.

There was a slight degree of bronchopneumonia and a healed tuberculosis in the lungs. Otherwise the examination was essentially negative.

DR. CABOT: Those of us who came out wrong will say that it was a badly taken history.

#### CASE 13033

#### A CASE OF THREATENED UREMIA

#### UROLOGICAL DEPARTMENT

A married Englishwoman forty-three years old entered January 8 complaining of pain in the abdomen, vomiting and chills.

Ever since the birth of a child sixteen years before admission she had had pain in the lower abdomen which had gradually grown worse. The year before admission she had her uterus and appendix removed for this. At that time she was catheterized. Two weeks after the operation she developed extreme frequency, nocturia 7-8, and difficult and painful urination. It was six months before these symptoms subsided. She now urinated only once at night and had no dysuria. At about the same time she began to have severe pain in the left lower quadrant similar to the pain for which her uterus was removed but worse. It came on between one and two in the morning, waking her from sound sleep and making her cry out. It would last from an hour to a day and a half and was always accompanied by very severe vomiting, leaving her exhausted. The pain was also associated with chills and fever. It radiated to the hips and also occurred in the right lower quadrant, never in the costovertebral angles. The attacks occurred once a week or oftener. Twice she noticed clots of blood in the urine. She had headaches, some loss of vision, and a bad taste in the mouth. For the past year she had been extremely nervous and had lost thirty pounds.

She knew little about her family history, nothing of significance. She had had no diseases except measles and occasional sore throats and colds. After a difficult labor sixteen years ago she had two repairs. She had had one miscarriage.

Clinical examination showed a thin, nervous, pasty looking woman with a staring expression of the eyes but no definite exophthalmos. The breath was ammoniacal. The teeth were in bad condition. There was pyorrhea. The tonsils were cryptic, with exudate. Chest examination was not satisfactory because of shivering. The location of the apex impulse of the heart is not recorded. The left border of dullness was 10 centimeters from midsternum, 2 centimeters outside the midclavicular line. The first heart

sound was unusually loud and long. There were no murmurs. The pulses and arteries were normal. The blood pressure was 120/82. The abdomen was negative except for splitting of the recti. Pelvic examination showed the perineum lax, the cervix lacerated, the uterus lacking. The pupils and fundi were normal. All the reflexes were hyperactive. There was unsustained ankle and patellar clonus on both sides. There were numerous muscular twitchings.

Before operation the amount of urine was 42 to 108 ounces. A catheterized specimen of urine at admission was cloudy, acid, specific gravity 1.012, a very slight trace of albumin, sediment loaded with leucocytes. A voided specimen January 22 was hazy, alkaline, specific gravity 1.004, a slight trace of albumin, sediment negative. Blood: hemoglobin 65 per cent., 4,500,000 reds. Renal function January 9 less than 10 per cent. in two hours, January 12 10 per cent. Non-protein nitrogen January 8 90, January 10 95, January 18 38, January 20 38. Uric acid January 8 9.9, January 10 8.5, January 18 4.5. January 20 3.8.

Before operation the temperature was 97.3° to 101.1°, the pulse 80 to 100, the respiration normal.

The patient was put on a low protein and moderately low salt diet with forced fluids, luminal, castor oil and calcium lactate.

January 11 X-ray examination was done and January 15 cystoscopy. The patient seemed less nervous and mentally clearer, and the non-protein nitrogen went down considerably.

January 22 operation was done. At night the patient was in moderately severe shock. 300 cubic centimeters of blood was transfused. The next day she was very weak and became cyanotic. The temperature was 103.5°, the pulse 132. The non-protein nitrogen was 32 milligrams. A medical consultant agreed that there was collapse of the left lung due to pneumothorax. A chest tap was done and 500 cubic centimeters of air withdrawn by suction. January 24 X-ray showed well defined pneumothorax on the left with almost complete collapse of the lung. The heart shadow was displaced somewhat to the right. In the right lung there were several calcified glands about the hilus and there was some thickening about the root shadows. The diaphragm was high on the right. January 25 300 cubic centimeters of air was withdrawn. There was some bloody fluid. The patient was stronger and fairly comfortable. Portable X-ray films taken on the 25th and 26th showed the lung markings now visible throughout the chest. The heart and mediastinal contents were somewhat to the left. The left chest was smaller than the right. Portable X-ray January 27 taken with the patient lying squarely on her right side showed almost complete expansion of the lung

There was a small area of pneumothorax at the extreme base and some increased density around the hilus which extended outward well into the midchest. The dullness was of rather even character, with poorly defined margins. It was thought it might represent a beginning pneumonic process. The temperature, pulse and respirations were lower. The leucocyte count was 23,700. Urine in small amounts was discharged in the dressing. January 28 a medical consultant who was asked to examine the chest and report on the cause of the persistent fever reported bronchial breathing, diminished tactile fremitus, peculiar voice and slight egophony at the left base posteriorly. The lungs showed slight hyperresonance. No succussion. The heart was in the normal position. There were no râles. "I can find no evidence of pneumonia. She has raised bloody sputum, probably from the nose. X-ray shows a hazy shadow in the left midchest region, possibly due to fluid in the pneumothorax cavity. The temperature and white count may be due to the effused blood. Desirable to know if the blood is infected."

January 31 the wick was removed. February 2 there was considerable drainage. A renal function test was 10 per cent. The wound healed well.

February 9 cystoscopy was done, and an X-ray examination. The patient stood it well and was up again the following day. February 11 another transfusion was done.

February 12 a second operation was done. The patient made a good recovery. Two days later urine was draining from both wounds and pus from the upper wound. By February 15 the temperature was normal. February 17 the upper wick fell out. That night the temperature rose to 102.6° without other apparent cause. There was some pain in the region of the incision. Some stitches of both wounds were removed. The following night the temperature again rose to 102°. The drainage became less. February 22 the lower wick fell out in dressing. The drainage was diminished. By the 24th the lower wound was dry. The upper granulations were burned with silver nitrate. There was still a small amount of drainage. The renal function test was 35%. February 26 another X-ray examination was done.

February 28 the patient was discharged with the upper wound healed except for a small scab at the lower end and the lower wound healed except for a small sinus at the upper end.

#### DISCUSSION

BY RICHARD F. O'NEIL, M.D.

Here we have a history of pain in the lower abdomen for sixteen years. Of course in a woman the first thing we would think of as a cause

of lower abdominal pain would be some lesion of the pelvic organs. But as she had a hysterectomy and appendectomy done a year previous to entrance, not only without relief but followed by an increase in discomfort, we can at once eliminate the pelvic organs and the appendix as a cause although we are told nothing of their condition.

The type of pain she complained of was severe, occurring between one and two a.m., waking her from a sound sleep and making her cry out, lasting from an hour or so to a day and a half. It was associated with nausea and vomiting, chills and fever. It radiated to the hip and also occurred in the right lower quadrant and had been in the left lower quadrant. In other words, intermittent attacks of colicky pain associated with fever, chills, nausea and vomiting. Such attacks might be attributed to cholecystitis and gall-stones, but there is no mention of jaundice and the pain was never in the epigastrium or the right upper quadrant. They are also compatible with symptoms caused by ureteral or renal calculi with infection, or some other kidney lesion with infection, as intermittent hydronephrosis or polycystic kidney. The absence of costovertebral tenderness is rather against pyelitis. But we know that in renal and ureteral lesions pain is frequently referred to other regions and that many chronic renal lesions have no pain in the back. I do not think that they suggest intestinal obstruction with acute exacerbation due to neoplasm, as sixteen years is a long time for such a condition to exist; although thirty pounds loss of weight is significant. The girdle pains of tabs are to be mentioned, but are not associated with fever and chills.

It is stated that she was catheterized after operation and that two weeks later she developed extreme frequency and nocturia with painful micturition, and that it was six months before these symptoms subsided. Of course post-operative retention is common, but two weeks is a long interval between the occurrence of symptoms and the catheterizing if the catheterization was the cause of the infection; and also six months is a long time for a so-called catheter cystitis to persist. Very rarely grave lesions of the bladder occur even to sloughing of the mucous membrane after long over-distension, but they are followed by permanent bladder symptoms, marked frequency and incontinence. But she now has no dysuria and gets up but once at night. To me this attack is much more suggestive of the lighting up of some preëxisting condition than of infection following catheterization. It also stated that on three occasions she had noticed blood in the urine. This is of great significance and immediately calls our attention to the urinary tract. The headaches, loss of vision

and bad taste in the mouth are all compatible with a renal lesion.

From this history it seems to me what evidence we have is directed mainly towards a lesion of the genito-urinary tract and we can get no further without physical examination, laboratory findings and diagnostic measures.

*Physical Examination.* There is nothing of note in the chest or abdomen. If she had polycystic kidneys I should expect them to be palpable. The reflexes and eye examination exclude tabs. The ammoniacal breath is very suggestive of a renal condition. The pelvic examination is what we should expect. The blood pressure is normal or below normal, certainly not suggestive of an arteriosclerotic process.

The amount of urine increased from forty-two ounces on entrance to one-hundred and eight ounces, the increase in amount being due undoubtedly to diuretics and forced fluids. The urine examination is distinctly abnormal, cloudy, acid, low specific gravity, 1.012, a slight trace of albumin, sediment, many leucocytes,—the typical urine of a pyelonephritis. The report of the second examination of the urine states the sediment was negative. This might mean an insufficient examination, or the urine had become so dilute that the pus cells were relatively very few in number.

The renal function was less than ten per cent. in two hours, a very low function.

The non-protein nitrogen on entrance was 90. This is from two and a half to three times the normal. It gradually fell to 38, which is high normal. The uric acid showed a corresponding decrease from 9.9 to 3.8, which is about normal.

Before operation she ran a moderate irregular fever with corresponding pulse variation.

The blood examination shows no secondary anemia to amount to anything, although the hemoglobin is below normal.

She was put on a low protein and moderately low salt diet with forced fluids and calcium lactate, which treatment resulted in marked fall in the non-protein nitrogen and uric acid. From these findings we can definitely state that we are dealing with a lesion of the urinary tract, a pyelonephritis with infection.

On January 11 an X-ray was taken.

#### X-RAY JANUARY 11

Bilateral renal calculi. A large triangular calculus filled each kidney pelvis. Just medial to the right ischial spine was an irregular shadow of increased density which might represent calculus in the uretero-pelvic junction. The right kidney shadow was fairly well defined. It was slightly larger than usual. There was slight scoliosis of the dorsal spine. There was an anatomical variation at the lumbosacral junction on the right, with sacralization of the transverse process of the last lumbar vertebra.

## FURTHER DISCUSSION

On January 15 a cystoscopic examination was made and the ureters catheterized. The divided function showed an appearance time of 10¾ minutes on the left, a function too low to be

read, and 32-40 pus cells per field. On the right an appearance time of 18¼ minutes, a function too low to be read, and 40-80 pus cells per field. Culture showed a profuse growth of colon bacilli from each side, evidently a bilateral process. An X-ray (Plate I) showed the catheter ap-



PLATE I. Taken January 15. A large triangular calculus fills each kidney pelvis. Just medial to the right ischial spine is an irregular shadow of increased density which may represent a calculus in the ureteropelvic junction. The catheter apparently lies in close contact with this shadow. The right kidney shadow is fairly well defined. It is slightly larger than usual. There is slight scoliosis of the dorsal spine. There is an anatomical variation at the lumbosacral junction on the right, with sacralization of the transverse process of the last lumbar vertebra.



parently lying in close contact with the shadow seen low down on the right.

On January 22 an operation was performed followed by a pneumothorax. This could mean but one thing, an operation on the kidneys during which the pleura had been opened. A blood transfusion was also done. January 31 the renal function was ten per cent., a definite improvement, and the operation wound healed.

On February 9 a second cystoscopic and X-ray examination was made.

#### PRE-OPERATIVE DIAGNOSIS JANUARY 22

Renal calculus.

#### FIRST OPERATION

Through a lumbar incision the left kidney was exposed without difficulty and found to be low but not especially adherent. The pelvis was extrarenal, of considerable size and very adherent to the surrounding fat. It was occupied by a large stone. The pelvic wall was much thickened and the mucosa velvety. A stone about the size of an English walnut was extracted without difficulty and without breakage. A thorough and careful search was then made of the kidney pelvis with a view to finding other shadows which appeared in the X-ray and which seemed to be two or three stones of small size, but none could be found. It was thought wiser in view of the woman's poor condition to leave these stones in the kidney rather than do an extensive search to find them. The pelvic incision was then closed. Rubber tissue wick.

During the process of enlarging the incision upwards under the rib the pleura was opened by an incision perhaps an inch long. This was immediately sutured with continuous catgut.

#### CYSTOSCOPY FEBRUARY 9

No pain or intolerance. The bladder and both ureters looked quite normal. A wax tipped catheter passed easily up the right ureter several times without any suggestion of obstruction. On removing the catheter no indication of a scratch on the wax tip could be seen.

Split function: right kidney 5 per cent., left kidney a trace of color, none after diluting. Right sediment, occasional leucocytes, no red cells; left sediment, 7-8 leucocytes, no red cells. There were a large number of small epithelial cells in both specimens which were extremely difficult to differentiate from leucocytes, so the result may not be correct.

An X-ray (Plate II) showed three small dense stones in the region of the lower calyx of the left kidney and a large stone in the pelvis of the right kidney with three or four smaller stones in the lower calyx.

#### FURTHER DISCUSSION

On February 11 a blood transfusion was done, undoubtedly as a safety measure.

February 12 a second operation was performed.

#### PRE-OPERATIVE DIAGNOSIS FEBRUARY 12

Renal calculus. Ureteral calculus.

#### SECOND OPERATION

Ethylene. The right kidney was exposed without difficulty and found to be like its mate, low, small, but not particularly abnormal either as to size or consistency. The pelvis was somewhat dilated, rather adherent, and was occupied by a large stone. This was easily removed through an incision in the pelvis. After this three smaller stones were found lying in the pelvis and were easily removed. A flexible bougie armed with a wax tip was then inserted down the ureter. On withdrawing it the wax tip was found to be heavily scratched by a stone. The incision in the pelvis was then closed with catgut. Rubber tissue wick. Abdominal wound closed in layers.

The patient was then turned on her back, and after suprapubic preparation a median incision was made four inches upward from the pubes. The bladder was pulled aside and after a good deal of difficulty, apparently owing to adhesions from the previous hysterectomy, the right ureter was found. It was moderately dilated and thickened. It was opened just above the bladder, and the grating of a stone could be felt. With the finger this stone could easily be palpated. Attempts to grasp the stone with forceps did not succeed, but after a little manipulation the stone was milked up and out of the incision. This stone could not be previously detected with a ureteral catheter armed with a wax tip and passed up the ureter through a cystoscope, possibly owing to the fact that the stone was covered with a layer of fibrin. The incision in the ureter was not sutured. Rubber tissue wick.

#### FURTHER DISCUSSION

The patient made a good convalescence from this and on February 24 the renal function was twenty-five per cent.

On February 26 another X-ray was taken.

#### X-RAY FEBRUARY 26

The shadows previously described in the region of the lower pole of the left kidney were still present. All other shadows had disappeared.

#### FURTHER DISCUSSION

February 28 the patient was discharged with the wound practically healed.

To summarize, we have a patient who came to the hospital in uremia, with no renal function; who had two operations performed, and who left the hospital in very fair condition, with a renal function of thirty-five per cent. For the sake of discussion, multiple operations on the kid-

ureters, resulting in better renal drainage with subsequent improvement in the renal function. Successive tapping of cysts in bilateral cystic kidney might have been done, or the removal of bilateral calculi from the kidneys or ureters.

A glance at the X-ray plates and the diagnosis



PLATE II. Taken February 9. Shows three small dense stones in the region of the lower calyx of the left kidney and a large stone in the pelvis of the right kidney with three or four smaller stones in the lower calyx.

neys may consist of a preliminary nephrotomy for drainage followed by a secondary nephrectomy, not probable in this case, as both kidneys were equally damaged. An operation might have been performed first on one side, then on the other, for intermittent hydronephrosis, suspension of the kidneys and freeing of the

at once becomes obvious. The first plate (Plate I) shows a large shadow in the pelvis of each kidney and several small ones in the calices, and low down in the region of the right ureter a shadow which was found by ureter catheterization to be a calculus.

The second plate (Plate II), taken after the

first operation, shows the large shadow on the right and three small shadows on the left. These are small stones the removal of which would have resulted in the destruction of valuable kidney tissue, so they were allowed to remain and will probably never give any trouble.

A plate taken after the removal of the calculi from the right kidney and ureter shows only the small shadow in the left kidney.

So that all the findings and laboratory data are easily accounted for, the low renal function, the high non-protein nitrogen and the abnormal urine. The pain was mostly of the referred type, although the calculus in the right ureter no doubt gave rise to the belief that the appendix was at fault, a very common error in so-called chronic appendicitis; in fact 25 per cent. of our cases of ureteral calculus have had some previous operation for some other supposed lesion without relief.

The choice of which side to operate first in bilateral calculi is always a nice one. In anuria due to bilateral calculi the rule is to operate first on the supposedly best of the two kidneys if it can be told. The same holds true of bilateral stone without anuria. In this case there was little choice, as the function was equally poor on both sides. But on the right there was also a ureteral calculus which would have to be removed for cure. This would mean a more severe surgical procedure, so the left side was done first with the idea that the patient would be able to stand the more prolonged operation better.

The first operation was a left pyelotomy complicated by pneumothorax due to accidentally opening the pleura; but no permanent damage resulted. The second operation was a right pyelotomy and right ureterotomy followed by a normal convalescence. It is interesting to note the improvement in renal function after the removal of the calculi in each operation, first to 10 per cent., then to 35 per cent.

DR. CABOT: Why should the urinary function go down so low with these stones?

DR. O'NEIL: The kidney function is always depressed in the presence of a calculus, and we frequently note the improvement in function after the calculus is removed. I suppose it is due to the pyelitis and pyelonephritis caused by the irritation of the calculus plus infection.

I believe in this case that the symptoms throughout the entire course of her illness were due to lesions of the urinary tract, and that neither the uterus nor the appendix had anything to do with them. There must have been gross change in the urine at the time her hysterectomy was performed which should have excited suspicion and a further study of the genito-urinary tract. An ordinary X-ray at that

time would have revealed the true condition and saved her an unnecessary major operation. I cannot imagine a better demonstration of the necessity for study of the urinary tract in cases of obscure abdominal pain before subjecting patients to various exploratory operations.

#### LATER NOTE

In December, ten months after her discharge, the patient writes: "I have no trouble with urination and no pain to speak of. My nerves are improving all the time. I weighed about ninety pounds when I left the hospital; my weight now is about one hundred and thirty-seven."

#### DIAGNOSIS

Left renal calculi.  
Right renal calculi.  
Right ureteral calculus.  
Left pyelotomy.  
Right pyelotomy and ureterotomy.

#### SMALLPOX IN MINNESOTA—1913-1925

In the *Public Health Reports* of December 3, 1926, page 2789, appears the statement that 1,298 cases of smallpox with 63 deaths had occurred in Minneapolis, Minn. Dr. A. J. Chesley, State health officer of Minnesota, advises that the number of deaths was 363, not 63, which gives a case fatality in this series of cases of more than 25 per cent.

Doctor Chesley sends the following statement of vaccination histories of smallpox cases which have occurred in Minnesota:

#### MINNESOTA, SMALLPOX

1925—Total cases, 973; total deaths, 198

*Class A.*—Successfully vaccinated within seven years before attack, 15 cases, or 1.54 per cent.; 1 death, or 0.51 per cent.

*Class B.*—Successfully vaccinated over seven years before attack, 191 cases, or 19.63 per cent.; 41 deaths, or 20.71 per cent.

*Classes C and D.*—Class C, never successfully vaccinated, and Class D, unable to give definite history of vaccination and no scar found, 767 cases, or 78.83 per cent.; 156 deaths, or 78.78 per cent.

1913-1925—Total cases, 39,250; total deaths, 613

*Class A.*—661 cases, or 1.68 per cent. of all; 1 death, or 0.16 per cent. of all deaths from smallpox.

*Class B.*—1,976 cases, or 5.03 per cent. of all; 89 deaths, or 14.52 per cent. of all deaths from smallpox.

*Classes C and D.*—36,613 cases, or 93.28 per cent. of all; 523 deaths, or 85.32 per cent. of all deaths from smallpox.—*Public Health Reports.*

## THE BOSTON Medical and Surgical Journal

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### THE RISE AND FALL OF EPIDEMIC DISEASES

To students of epidemic disease there appear certain inexplicable shifts in the great plagues which from time to time have swept over the world. Even in our own time with all the resources of bacteriological and epidemiological research at our disposal, new diseases apparently hitherto unknown arise among us. A striking local example of this is the recent outbreak of so-called Haverhill fever\*. The great increase in the last few years in the prevalence of encephalitis lethargica is another example of the shortcomings of our scientific defense against disease.

To any student of medical history it is obvious that these experiences are not unique in our own time, but have been repeatedly noted in the past. Diphtheria with its striking examples could hardly have been overlooked, yet it was not until about 1583 in Spain that it was encountered and finally disappeared in 1642 after terrible ravages in the southern European countries to lie dormant for many years. In fact diphtheria

was so rare in the first half of the nineteenth century (other than a few outbreaks in France) that in Germany only a few physicians saw it and many denied the existence of such a disease. However, when after 1850 it began to spread, its mortality became tremendous.

Cholera apparently suddenly arose, our first knowledge of it being the virtual extermination of an army in India in the eighteenth century. Shortly after this time it spread throughout the entire world. When we consider the active trade carried on between India and Europe for many centuries and then extended even to America, it is strange that, if this disease existed previously, it should have waited hundreds of years before spreading over the world.

While the problem of the origin of disease *de novo* is a very difficult one to decide, it certainly is the duty of physicians, not only to fight existing diseases, but to be on the watch for and to combat new diseases as they arise. At the same time the study of epidemiology should warn us against the danger of giving too great credit to our prophylactic measures when certain diseases become less prevalent, for study of past epidemics shows just such a falling off in mortality and morbidity as we are at present experiencing in the case of diphtheria and scarlet fever.

### EXPERT TESTIMONY AND THE PSYCHIATRIST

The medical expert is often made the laughing stock of the courts, when his testimony is handled "adroitly" by the able but also "clever" lawyer. This is especially true in cases of "insanity," where the prisoner's "mentality" is questioned and various degrees of "responsibility" and "right and wrong" have to be determined. The courts deal with facts and expect concrete definitions of the vague type of behavior which is technically and popularly regarded as criminal. This the psychiatrist can not give, for, at the present time, there is both insufficient information and insufficient general agreement on the problem.

Two distinct steps in advance, however, have been made in the last year. The Briggs law has gone into effect in Massachusetts, which makes it possible for two psychiatrists, under the Department of Mental Disease, to examine all prisoners accused of a capital crime, or those previously convicted or previously indicted more than once. Thus the medical expert gives his opinion before the trial and reports to the court itself. In this way it is hoped that much partial medical testimony, paid for by the prosecution and defense, will be eliminated.

In addition, a committee of the American Psychiatric Association has made certain valu-

\*Parker and Hudson. Am. Jour. Path., 1926, II:357.



able recommendations in addition to their statement that "the recent Massachusetts laws offer the best practical technique so far presented." They feel that "the word 'responsibility,' as well as the word 'insanity,' and other similar static concepts should be eliminated entirely and endeavor made to determine rather the capabilities and incapacities of the accused, or a specification of whether or not the mental status (disease, defeat, trend, etc.) of the offender was likely to lead to neglect or danger to himself or to others." In other words, the psychiatrist is not merely an alienist, deciding the certifiability or non-certifiability of a prisoner, but he regards the criminal as a patient, a candidate for diagnosis, prognosis and treatment. That only a few physicians, trained in mental disease, are capable of making a careful estimate of an offender's mental status, is well recognized. The American Psychiatric Association would, therefore, "publish official standard qualifications of medico-legal experts, and maintain a published list of such qualified experts, revised annually, for the convenience of the court selection." Qualified men making impartial examination: such a Utopia may not be so very far away in Massachusetts.

#### THE WORKMEN'S COMPENSATION LAW

THE Special Commission appointed by the Governor to investigate the operation of the Workmen's Compensation Law has filed its report with the Legislature. The full text is not yet printed but a summary is available. A number of far reaching changes are suggested. The five members of the Commission are unanimous in their recommendations except in the matter of establishing an exclusive State fund as has been done in Ohio. Mr. Joyce, the Secretary-Treasurer of the Massachusetts Branch of the American Federation of Labor alone favors this plan. Mr. Curtis and Mr. Tansey recommend a constitutional amendment permitting the Legislature to make workmen's compensation compulsory. In order to provide insurance for those otherwise unable to obtain it, they suggest a competitive State Fund. Higher weekly rates of compensation; a removal of the limitation to five as the number of children to be compensated; added control over rates by the Insurance Commissioner; the protection of the workmen employed in violation of certain laws; the protection of those injured in line of duty outside the premises of the employer; a wider application of the law to public employees; the removal of the time limit upon lump sum settlements; the permission to those peculiarly liable to injury to waive their own rights in order that they may get work are among the recommendations made.

Certain recommendations very definitely concern the Medical Profession and Hospital Officials.

The present rate of \$21.00 a week for hospital care is considered too low. It is recommended that the Industrial Accident Board fix the rates from time to time at the conference with representatives of the hospitals. It is further suggested that the Board and the Department of Public Welfare devise a simple and effective manner of ascertaining actual hospital costs.

The Commission feels that each hospital through the Board of Trustees should decide the question of payment of members of the Hospital Staff.

In order to remove existing doubts it is recommended that industrial diseases be considered as injuries under the act.

In order to restore protection to those excluded by judicial interpretation of the words "unusual cases" the Commission recommends that medical and hospital care and all expenses necessarily incident to such service be provided during the first two weeks after injury and in the discretion of the department for a longer period "whenever necessary for the cure, rehabilitation, or proper care" of an injured employee.

An important recommendation is that for a more reasonable and definite schedule for injuries, taking into account the relative importance of the injured part in the occupation of the workman. Deafness and disfigurement are recognized as injuries. A more reasonable compensation for loss of eyesight is recommended.

"Careful study of the value of rehabilitation both socially and financially, convinced the commission that much constructive work has been left undone in this field which would be not only beneficial to injured employees but save very large sums to the insurance carriers, if performed. It is, therefore, recommended that a new fund be established to which the insurers shall contribute a certain percentage of the amount they pay for specific injuries. The State is asked to contribute an equal sum and the total of these two may be used to match Federal contributions. This should furnish adequate funds for a thorough-going and ample program of vocational rehabilitation."

The confidence the Commission has in the Industrial Accident Board is shown by the recommendations already cited and by further recommendations and comments.

It is suggested that the Board establish its own rules of evidence, and that findings on facts be considered as final. It is further suggested that Judges of the Superior Court may reserve appeals for the Supreme Court, thus simplifying legal procedure.

The wisdom and discretion of the Board is



attested by the manner in which their rulings have been supported by the Supreme Court.

The report of the Commission which includes in its membership Dr. Samuel B. Woodward of Worcester is most thorough and judicious. The Medical profession will be helped by the adoption of its recommendations. The changes suggested mark further steps forward in an act which on the whole has worked most beneficially. The physicians of the State must do their share and particularly must be ready to aid in carrying out the suggestions regarding rehabilitation.

### THIS WEEK'S ISSUE

CONTAINS articles by the following authors:

PRATT, JOSEPH H., P.H.B.; A.M.; M.D. Johns Hopkins Medical School; Consulting Physician to the Brookton Hospital and the Chelsea Memorial Hospital. Member of several medical societies. His subject is: "The Influence of Osler on the Practice of Medicine." Page 83. Address: 270 Commonwealth Avenue, Boston.

TALBOT, FRITZ B., A.B.; M.D. Harvard Medical School 1905; Professor of Pediatrics Harvard Medical School. Address: Massachusetts General Hospital. Associated with him is

METCALF, KENNETH M., M.D. University of California Medical School 1924; Assistant in Pediatrics Harvard Medical School, and

MORIARTY, MARGARET, S.B. Simmons College. Their subject is: "A Clinical Study of Epileptic Children Treated by Ketogenic Diet." Page 89.

FINKELSTEIN, NATHAN, M.D. Tufts College Medical School 1912. F.A.C.S. His subject is: "Ureteral Obstruction with Abdominal Pain as Chief Complaint. Report of Six Cases." Page 96. Address: 184 North Street, Pittsfield, Mass.

HILL, LEWIS W., M.D. Harvard Medical School 1913, Assistant Visiting Physician Children's Hospital, Boston; Assistant in Pediatrics Harvard Medical School. His subject is: "A Note on the Complications of Pneumonia in Infants and Children." Page 107. Address: 483 Beacon Street, Boston.

### LEGISLATIVE NOTES

Anybody who is interested in Legislation and who may not know the representative or senator of his District may secure this information by applying to the BOSTON MEDICAL AND SURGICAL JOURNAL.

The following bill is listed for a hearing before the Committee on Public Health. The exact date has not yet been announced.

### HOUSE No. 204

By Mr. Washburn of Worcester, petition of Slater Washburn relative to the vaccination of certain children in private schools. Public Health. Dec. 23, 1926.

An Act requiring the Vaccination of Certain Children in Private Schools

*Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:*

SECTION 1. Chapter seventy-six of the General Laws is hereby amended by striking out section fifteen and inserting in place thereof the following:—

*Section 15.* A minor under fourteen years of age who has not been vaccinated shall not be admitted to a public or private school except upon presentation of a certificate signed by a registered physician that the physician has, at the time of giving the certificate, personally examined the child and that he is of the opinion that the physical condition of the minor under fourteen years of age is such that his health will be endangered by vaccination. The said certificate shall state the reasons for the opinion of the physician who signs it, and shall be valid only for one year from the date thereof. A minor under fourteen years of age who is a member of a household in which a person is ill with smallpox, diphtheria, scarlet fever, measles or any other infectious or contagious disease declared by the department of public health to be dangerous to the public health, or of a household exposed to such contagion from another household as aforesaid, shall not attend any public or private school during such illness until the teacher of the school has been furnished with a certificate from the board of health of the city or town, or from the attending physician of such person, stating that the danger of conveying disease by the child had passed.

SECTION 2. This act shall not be construed to affect the rights of any foreigner admitted to this country under treaty stipulations which are inconsistent herewith.

### REPORTS AND NOTICES OF MEETINGS

#### SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

THE next meeting of the Society for Experimental Biology and Medicine, Massachusetts Branch will be held on Wednesday evening, January 26, 1927, at 8:15 P. M., at the American Academy of Arts and Science, 28 Newbury Street.

The program is as follows:

1. "Further Study on Bacterial Allergy," by Hans Zinsser and Francis Grinnell.
2. "Comparative Nomography of Blood," by Lawrence J. Henderson, Arlie V. Bock, David B. Dill, Louis M. Hurxthal and C. Van Cauelaere.
3. "Speculations Concerning Pernicious Anemia," by George R. Minot.

#### NEW ENGLAND ROENTGEN RAY SOCIETY

The mid-winter meeting of the Section of Radiology and Physiotherapy of the Massachusetts Medical Society combined with the monthly meeting of the New England Roentgen Ray Society will be held at Boston City Hospital, Boston, Massachusetts, Friday, January 21, 1927.

The section officers of the Massachusetts Medical Society are: Dr. Frank B. Granger, Chairman; Dr. Frederick W. O'Brien, Secretary.

The officers of the New England Roentgen Ray Society are: Dr. Philip Cook, President; Dr. Merrill Sosman, Secretary.

Morning Session—10 A. M. until noon, Amphitheatre, Thorndike Building:

Practical Clinic in Physiotherapy, X-Ray and Radium.

Afternoon Session—Main Surgical Amphitheatre:

1. The Treatment of Fractures with Special Reference to the Use and Abuse of Physiotherapy in the Same, by Dr. Frederic J. Cotton. Discussion to be opened by Dr. Otto J. Hermann.

2. Electrical and Surgical Methods in Tonsils (with demonstration), by Dr. William D. McFee. Haverhill.

3. Indications for Non-Surgical Treatment of Hemorrhoids, by Dr. T. Chittenden Hill.

4. Melanoma (demonstration of case), by Dr. Frederick W. O'Brien. Discussion to be opened by Dr. Robert Cochrane and continued by Dr. Frank B. Mallory.

Evening Session—8 P. M.:

Dr. James S. Stone, President of the Massachusetts Medical Society. Five minutes.

Dr. Douglas Quick, Memorial Hospital, New York City: The Treatment of Intra-oral New Growth. Twenty minutes. Discussed by Dr. Irving J. Walker, five minutes, and Dr. Robert B. Greenough, five minutes.

Dr. Stuart Pritchard, Battle Creek, Mich.: The Supraglottic Injection of the Bronchi with Lipiodol. Twenty minutes. Discussed by Dr. Horace Binney, five minutes, and Dr. Harry P. Cahill, five minutes.

#### MEETING OF THE AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The American Association for the Study of Goiter will hold its annual clinical meeting at Philadelphia, Pennsylvania, January 31 and February 1 and 2.

An unusually high class scientific program has been secured by Doctor Emil Goetsch of Brooklyn, New York, the president, and by Doctor Kerwin Kinard of Kansas City, Missouri, the secretary. Many of the well known goiter men of the country have accepted places on the program.

The forenoons will be devoted to clinics at the University of Pennsylvania Hospital; the afternoons to the scientific sessions in the assembly room of the Bellevue Stratford Hotel. All members of State Societies are most cordially invited.

Among the speakers are Crotti of Columbus, Ohio; Fahrni of Winnipeg, Canada; Tiffin of Seattle; Shivers of Colorado Springs; Gillette of Toledo, Ohio; Dorsey of Keokuk, Iowa; Krall of Kansas City.

#### BOSTON MEDICAL HISTORY CLUB

The next meeting will be held on Friday, January 28, 1927, at the Warren Museum, Harvard Medical School, at 8:15 P. M.

##### PROGRAM

1. Dr. Robert Knox and the Edinburgh Murders. Dr. William H. Robey.

2. The Spurzheim Collection of Phrenological Casts. Dr. William P. Coues.

3. The Phrenological Societies and their Journals. Dr. John F. Fulton.

4. Presentation of a Portrait of Spurzheim to the Warren Museum. Dr. Harvey Cushing.

HENRY R. VIETS, M.D., Secretary.

#### COMBINED MEETING OF THE SUFFOLK DISTRICT MEDICAL SOCIETY AND THE BOSTON MEDICAL LIBRARY

ON Wednesday evening, January 26th, a combined meeting of the Suffolk District Medical Society and the Boston Medical Library will be held at the Boston Medical Library. Dr. Augustus Knight, who had been announced as the speaker of the evening, has been forced to postpone his appearance until later in the year. The committee in charge of the program has been fortunate in securing as speaker, in place of Dr. Knight, Dr. James E. Paullin of Atlanta, Georgia. Boston men who, during the war, were assigned to Camp Shelby, Mississippi, remember that Dr. Paullin was the Chief Medical Officer at that Camp. He is now Professor of Internal Medicine at Grady University, Atlanta. His subject will be "The incidence of syphilitic infection among negroes in the South; its influence in the causation of disability and the methods being used to combat infection." Dr. Paullin is bringing with him Dr. James R. McCord, Attending Gynecologist and Obstetrician of the Grady Memorial Hospital. Dr. McCord will speak on "Syphilis as a Complication of Pregnancy in the Negro."

The members of the Suffolk District Medical Society are invited by the Staff of the New England Deaconess Hospital to a series of demonstrations and informal clinics and a reception in honor of Dr. J. E. Paullin, Professor of Medicine, Dr. J. R. McCord, Professor of Obstetrics, Grady University, Atlanta, Georgia, on Wednesday.

day afternoon, January twenty-sixth, at a quarter after four.

R. S. V. P. The Staff, New England Deaconess Hospital, Boston.

This is an unusual opportunity for the members of the Suffolk District to show their appreciation of the courtesy extended by these southern gentlemen to come north and visit with the physicians of Suffolk County. The demonstrations referred to in the invitation will present novel and new ideas in chemistry, metabolism, pathology and x-ray and border line wards in medicine and surgery.

An important feature of the meeting will be the christening of the Little Room for the prevention of diabetic gangrene. The standing of these visitors from the South, the importance of the suggestions which will be submitted and the additional value of the demonstrations ought to induce the largest possible number of physicians from this section to attend these exercises.

We trust that Suffolk District will demonstrate a spirit of cordiality which will represent the progressive spirit of New England medicine.

### THE NORFOLK DISTRICT MEDICAL SOCIETY

A REGULAR meeting of the society will be held in the Amphitheatre of the Peter Bent Brigham Hospital, January 25th, at 8:15 P. M. sharp. Telephone Regent 5620.

The paper of the evening will be read by Dr. Harvey Cushing who will announce his subject at the meeting.

Dr. Cushing is a member of the Norfolk District—favor him with a large attendance! Convenient access to amphitheatre from Van Dyke Street. Refreshments after the meeting.

FRANK S. CRUICKSHANK, M.D., Sec.  
23 Bay State Road.

### MASSACHUSETTS STATE NURSES ASSOCIATION

#### NORFOLK AND SUFFOLK COUNTY BRANCHES

NEXT meeting, Wednesday, January 26, 1927, at 8:15 p. m., at Thorndike Memorial Auditorium, Boston City Hospital. Subject: "Health Units of Boston." Speaker: Dr. Charles F. Wilinsky, Deputy Commissioner, Child Hygiene Division, Boston, Mass.

MARY ALICE McMAHON, Secretary,  
Boston State Hospital.

### MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

THE annual meeting will be held at the 20th Century Club, 3 Joy Street, Boston, on Thurs-

day, January 27, 1927, at 12:30 P. M. The meeting will be devoted to cancer and recent state legislation on cancer. Dr. James S. Stone, President of the Massachusetts Medical Society and Dr. George H. Bigelow, Commissioner of the Massachusetts State Department of Health as speakers. All interested are invited. In connection with this meeting, the Association has distributed circulars giving a list of ex-officers, which includes some of the foremost authorities on health matters in Massachusetts, and the suggestion has been made that since this is the oldest organized health association in this country, every effort should be made to bring all persons interested in public health in this State into active cooperation with it. To this end it is suggested that its membership should be very largely increased, and it is hoped that there will be a very general response to this invitation. Applications for membership may be made to the Secretary, Stephen L. Maloney, P. O. Box 5271, Boston.

### SOCIETY MEETINGS

#### DISTRICT MEDICAL SOCIETIES

##### Essex North District Medical Society

Wednesday, May 4, 1927—Annual meeting. Russell Hall, Young Men's Christian Association Building, 40 Lawrence Street, Lawrence.

Thursday, May 6, 1927—Censors meet for examination of candidates at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M.

##### Essex South District Medical Society

Wednesday, February 2, 1927—Hawthorne Hotel, Salem. Dr. H. H. Clute of the Lahey Clinic, "Differential Diagnosis and Treatment of Thyroid Disease." Discussion by Drs. Johnson of Beverly and Field of Salem, ten minutes each.

Wednesday, March 2, 1927—Lynn Hospital, Clinic, 5 P. M.; supper, 7 P. M. Dr. George Minot, "Fetorosis Anemia, with Special Reference to Liver Diet." Discussion by Drs. Sargent of Salem and Reynolds of Danvers, ten minutes each.

Wednesday, April 6, 1927—Danvers State Hospital, Clinic, 5 P. M. Dr. Allan W. Rowe, Chief of Research Service at Evans Memorial, "The Differential Diagnosis of Endocrine Disorders." Followed by dinner. Discussion by Drs. Wood of Hathorne and Kline of Beverly, ten minutes each.

Thursday, May 6, 1927—Censors meet for examination of candidates at the Salem Hospital, 3:30 P. M.

Wednesday, May 11, 1927—Annual meeting. The Tavern, Gloucester. Speaker and subject to be announced later.

##### Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District for the remainder of the year. Minor changes may be made in case of necessity.

January 25, 1927—Peter Bent Brigham Hospital. Dr. Harvey Cushing. Time of meeting and subject to be announced.

March 1, 1927—Roxbury Masonic Temple, 8:15 P. M. Dr. Robert B. Greenough. To be devoted to a talk on cancer, with a résumé of the results of colloidal lead treatment.

March 29, 1927—Roxbury Masonic Temple, 8:15 P. M. Dr. F. S. Newell and F. J. Irving, "The Modern Treatment of the Eclampsia and Toxæmia of Pregnancy." If time permits—"The Modern Methods of Handling Prospective Caesarean Cases."

May 10, 1927—Annual meeting. Details of meeting to be announced.

##### Suffolk District Medical Society

Meetings of the Suffolk District Medical Society and the Boston Medical Library will be held at the Boston Medical Library, 8 The Fenway, Boston, at 8:15 P. M., as follows:

January 26, 1927—General meeting in association with the Boston Medical Library. "Medical Work at the Metropolitan Life Insurance Company." Dr. Augustus I. Knight, Medical Director, Metropolitan Life Insurance Company.

February 23, 1927—Surgical Section. "Clinic on Neurological Cases at the Peter Bent Brigham Hospital," Dr. Harvey Cushing.

March 30, 1927—Medical Section. Subject and speaker to be announced later.

April 27, 1927—Annual meeting. Election of officers. "Medical Education in the Orient and Occident." Dr. David L. Edsall, Dean, Harvard Medical School.

Notices of meetings must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear.